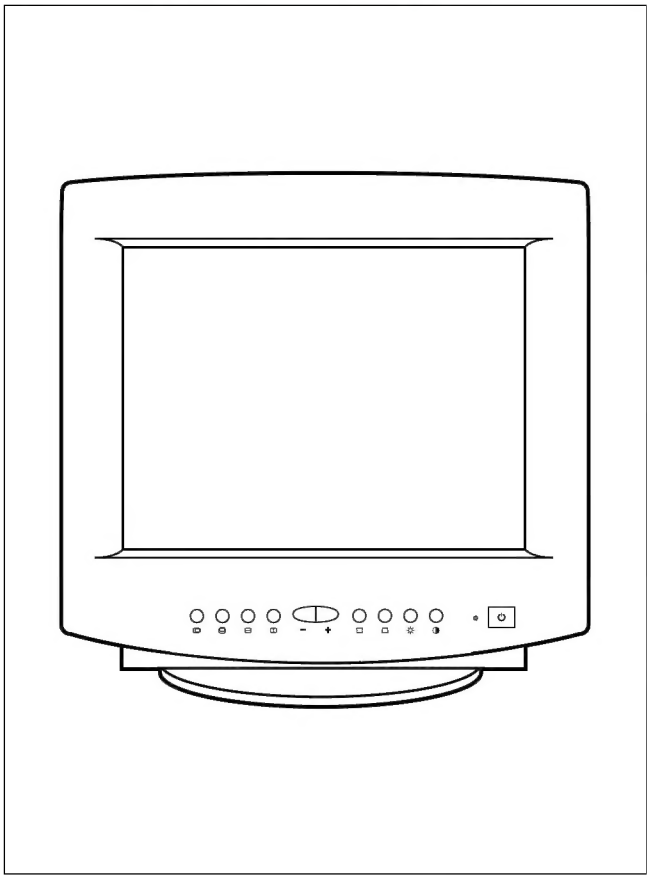
# COLOR MONITOR

**CKA4217L**
**CKA4227L**
**CKA5227L**

# SERVICE Manual

## COLOR MONITOR



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# 1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock and X-rays.

## 1-1 Safety Precautions

### 1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power before servicing.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

### 1-1-2 Servicing the High Voltage System and CRT

**WARNING: Empty or damaged $E^2$PROM may cause excessive x-ray emissions.**

**Caution:** When replacing the $E^2$PROM, IC203 a high voltage step must be adjusted until high voltage becomes 24.5 kV. Standard dump from Softjig does this.

1. When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (Disconnect the AC line cord from the AC outlet.)
2. **High Voltage Adjustment**
   This monitor does not need to adjust high voltage, standard dump from Softjig automatically adjust the high voltage to 24.5kV.
3. It is essential that service technicians have an accurate high voltage meter available at all times. Check the calibration of this meter periodically.
4. When troubleshooting a monitor with excessively high voltage, avoid being unnecessarily close to the monitor. Do not operate the monitor for longer than is necessary to locate the cause of excessive voltage.
5. High voltage should always be kept at the rated value, no higher. Be sure all service personnel are aware of the procedures and instructions covering X-rays.

   The only potential source of X-ray in current solid state display monitors is the tube. However, the CRT does not emit measurable X-ray radiation if the high voltage is at the high voltage adjustment value.

   Only when high voltage is excessive are X-rays capable of penetrating the shell of the CRT, including the lead in glass material. Operation at high voltages may also cause failure of the CRT or high voltage circuitry.
6. When the high voltage regulator is operating properly, there is no possibility of an X-ray problem. Test the brightness and use a meter to monitor the high voltage each time a color monitor comes in for service. Make sure the high voltage does not exceed its specified value and that it is regulating correctly.
7. The CRT is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the CRT with only one that is the same or equivalent type as the original. Carefully reinstall the CRT shields and mounting hardware; these also provide X-ray protection.
8. Handle the CRT only when wearing shatterproof goggles and after completely discharging the high voltage anode.
9. Do not lift the CRT by the neck.

## 1-1-3 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.

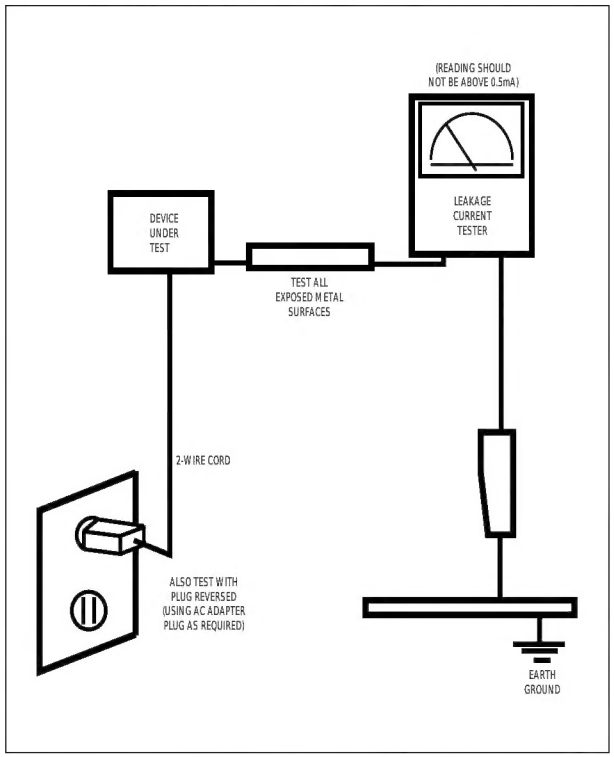



Figure1-1. Leakage Current Test Circuit

3. Leakage Current Hot Check (Figure 1-1):
   **WARNING: Do not use an isolation transformer during this test.**
   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).
4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

## 1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schmatics and parts lists. Asubstitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and / or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

Components identified by ☢ on schematics and parts lists must be sealed by a soldering iron after replacement and adjustment.

## 1-2 Servicing Precautions

**WARNINGS: An electrolytic capacitor installed with the wrong polarity might explode.**

**Cautions:** Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

When replacing the $E^2$PROM, high voltage step must be adjusted until high voltage becomes 24.5 kV. Standard dump from Softjig does this.

**Note:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

### 1-2-1 General Servicing Precautions

1. Servicing precautions are printed on the cabinet, and should be followed closely.
2. Always unplug the unit's AC power cord from the AC power source before attempting to:
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the +B voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

## 1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   **Caution:** Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.
9. ⚠ Indicates ESDs on the Schematic Diagram in this manual.

# 2 Product Specifications

## 2-1 Specifications

| Item | Description | |
|---|---|---|
| Picture Tube: | CKA42*7L: 14-Inch (36 cm); 13.2-Inch (33.5 cm) viewable, 90° Deflection,<br>CKA5227L: 15-Inch (38 cm); 13.8-Inch (35 cm) viewable, flat-face tube, 90° Deflection,<br>0.28 mm Dot pitch, Semi-tint, Non-glare, Antistatic silica coating, Invar shadow mask | |
| Scanning Frequency | Horizontal : 30 kHz to 55 kHz (Automatic)<br>Vertical : 50 Hz to 120 Hz (Automatic) | |
| Display Colors | Unlimited colors | |
| Maximum Resolution | Horizontal : 1024 Dots<br>Vertical : 768 Lines | |
| Input Video Signal | Analog, 0.714 Vp-p positive at 75 Ω, internally terminated | |
| Input Sync Signal | Separate Sync : TTL level positive/negative | |
| Maximum Pixel Clock | 65 MHz | |
| Active Display | CKA42*7L | CKA5227L |
| Horizontal<br>Vertical | 255 mm ± 3 mm (4:3 ratio)<br>191 mm ± 3 mm | 267 mm ± 3 mm (4:3 ratio)<br>200 mm ± 3 mm |
| Input Voltage | AC 90 to 264 Volts, 60 Hz/50 Hz ± 3 Hz | |
| Power Consumption | 73 Watt (max) | |
| Dimensions | CKA42*7L | CKA5227L |
| Unit (W x D x H)<br>Carton (W x D x H) | 13.7 x 15.2 x 14.3 Inches (348 x 385 x 362.5 mm)<br>16.6 x 18.1 x 15.4 Inches (422 x 460 x 390 mm) | 14.6 x 15.6 x 14.8 Inches (370 x 395 x 377 mm)<br>17.9 x 19.6 x 17.0 Inches (454 x 497 x 433 mm) |
| Weight (Net/Gross) | CKA42*7L : 23.1 lbs (10.5 kg) / 27.3 lbs (12.4 kg)<br>CKA5227L : 27.6 lbs (12.5 kg) / 30.9 lbs (14.0 kg) | |
| Environmental Considerations | Operating Temperature : 32°F to 104°F (0°C to 40°C)<br>Humidity : 10 % to 80 %<br>Storage Temperature : -4°F to 113°F (-20°C to 45°C)<br>Humidity : 5 % to 95 % | |
| CRT Code No. | | |

- CKA42*7L/5227L complies with SWEDAC (MPR II) recommendations for reduced electromagnetic fields.
- Designs and specifications are subject to change without prior notice.

## 2-2 Pin Assignments

| Sync Type / Pin No. | 15-Pin Signal Cable Connector (Figure 2-1) |
|---|---|
| | Separate |
| 1 | Red |
| 2 | Green |
| 3 | Blue |
| 4 | GND |
| 5 | DDC Return |
| 6 | GND-R |
| 7 | GND-G |
| 8 | GND-B |
| 9 | Reserved |
| 10 | GND-Sync/Self-raster |
| 11 | GND |
| 12 | DDC Data |
| 13 | H-Sync |
| 14 | V-Sync |
| 15 | DDC Clock |

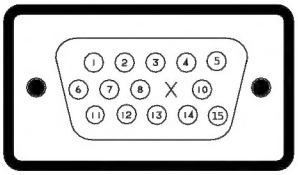


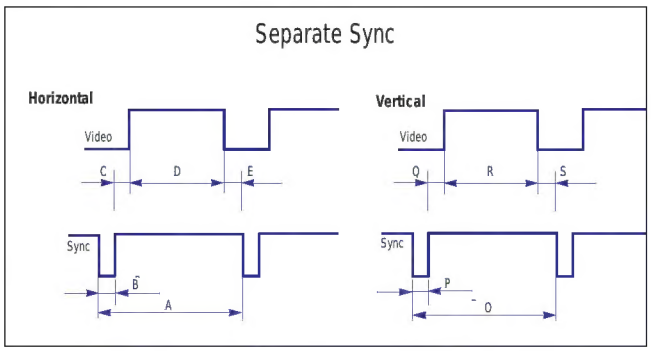

Figure 2-1. M ale Type

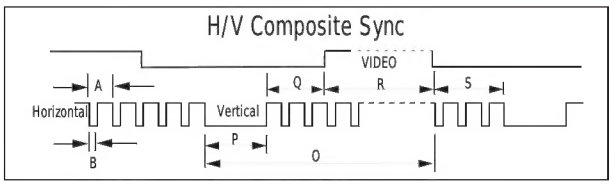
## 2-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 2-1. Timing Chart

| Mode / Timing | IBM | | VESA | | | | |
|---|---|---|---|---|---|---|---|
| | 720/70 Hz 720 x 400 | 640/60 Hz 640 x 480 | 640/75 Hz 640 x 480 | 640/85 Hz 640 x 480 | 800/75 Hz 800 x 600 | 800/85 Hz 800 x 600 | 1024/60 Hz 1024 x 768 |
| fH (kHz) | 31.469 | 31.469 | 37.500 | 43.269 | 46.875 | 53.674 | 48.363 |
| A µsec | 31.777 | 31.778 | 26.667 | 23.111 | 21.333 | 18.631 | 20.677 |
| B µsec | 3.813 | 3.813 | 2.032 | 1.556 | 1.616 | 1.138 | 2.092 |
| C µsec | 1.907 | 1.907 | 3.810 | 2.222 | 3.232 | 2.702 | 2.462 |
| D µsec | 25.422 | 25.422 | 20.317 | 17.778 | 16.162 | 14.222 | 15.754 |
| E µsec | 0.636 | 0.636 | 0.508 | 1.556 | 0.323 | 0.569 | 0.369 |
| fV (Hz) | 70.087 | 59.940 | 75.000 | 85.008 | 75.000 | 85.061 | 60.004 |
| O msec | 14.268 | 16.683 | 13.333 | 11.764 | 13.333 | 11.756 | 16.666 |
| P msec | 0.064 | 0.064 | 0.080 | 0.069 | 0.064 | 0.056 | 0.124 |
| Q msec | 1.080 | 1.048 | 0.427 | 0.578 | 0.448 | 0.503 | 0.600 |
| R msec | 12.711 | 15.253 | 12.800 | 11.093 | 12.800 | 11.179 | 15.880 |
| S msec | 0.413 | 0.318 | 0.027 | 0.023 | 0.021 | 0.019 | 0.062 |
| Clock Frequency (M Hz) | 28.322 | 25.175 | 31.500 | 36.000 | 49.500 | 56.250 | 65.000 |
| Polarity H.Sync | Negative | Negative | Negative | Negative | Positive | Positive | Negative |
| V.Sync | Positive | Negative | Negative | Negative | Positive | Positive | Negative |
| Remark | Separate | Separate | Separate | Separate | Separate | Separate | Separate |




| | | | |
|---|---|---|---|
| A : Line time total | B : Horizontal sync width | O : Frame time total | P : Vertical sync width |
| C : Back porch | D : Active time | Q : Back porch | R : Active time |
| E : Front porch | | S : Front porch | |

# Memo

# 3 Operating Instructions

## 3-1 Front View and Controls

### 3-1-1 CKA4227L Front View

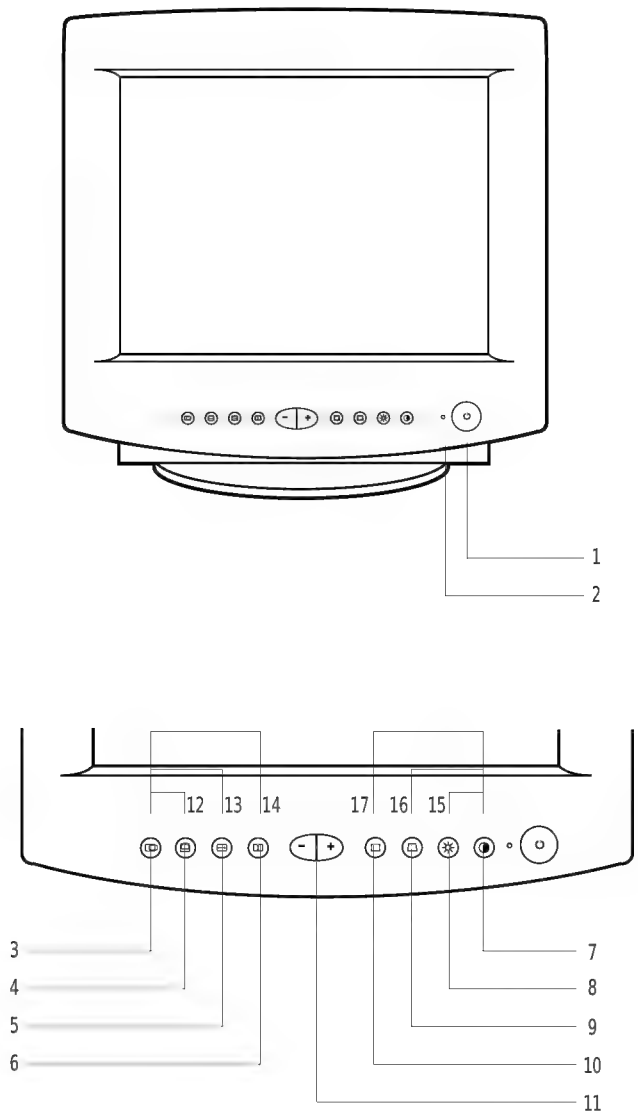



Figure 3-1. Front Control Panel

Table 3-1. Front Panel Controls

| Location | Symbol | Description |
|---|---|---|
| 1 | | Power Button |
| 2 | | Power Indicator LED (Dual Color) |
| 3 | | Horizontal Position Button |
| 4 | | Vertical Position Button |
| 5 | | Horizontal Size Button |
| 6 | | Vertical Size Button |
| 7 | | Contrast Control |
| 8 | | Brightness Control |
| 9 | | Trapezoid Button |
| 10 | | Side Pincushion Button |
| 11 | | Adjustment Buttons |
| 12 | + | Parallelogram |
| 13 | + | V-Linearity |
| 14 | + | Pinbalance Button |
| 15 | + | Degauss |
| 16 | + | Recall |
| 17 | + | User Delete |

## 3-1-2 CKA5227L Front View

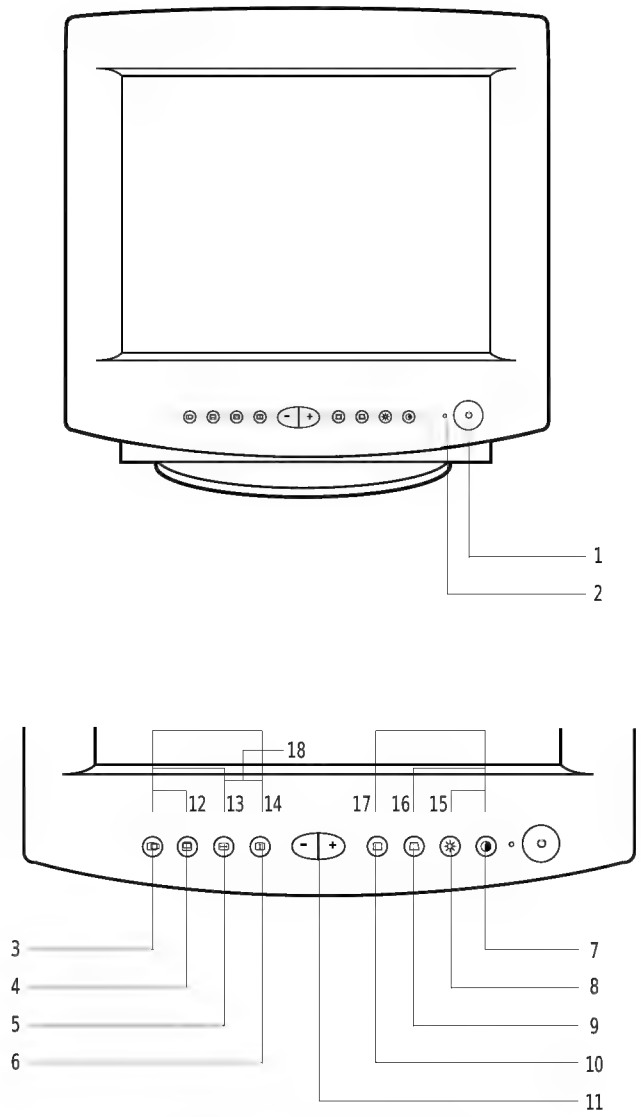



Figure 3-2. Front Control Panel

Table 3-2. Front Panel Controls

| Location | Symbol | Description |
|---|---|---|
| 1 | | Power Button |
| 2 | | Power Indicator LED (Dual Color) |
| 3 | | Horizontal Position Button |
| 4 | | Vertical Position Button |
| 5 | | Horizontal Size Button |
| 6 | | Vertical Size Button |
| 7 | | Contrast Control |
| 8 | | Brightness Control |
| 9 | | Trapezoid Button |
| 10 | | Side Pincushion Button |
| 11 | | Adjustment Buttons |
| 12 | + | Parallelogram |
| 13 | + | V-Linearity |
| 14 | + | Pinbalance Button |
| 15 | + | Degauss |
| 16 | + | Recall |
| 17 | + | User Delete |
| 18 | + | Tilt (Optional) |

## 3-1-3 CKA4217L Front View

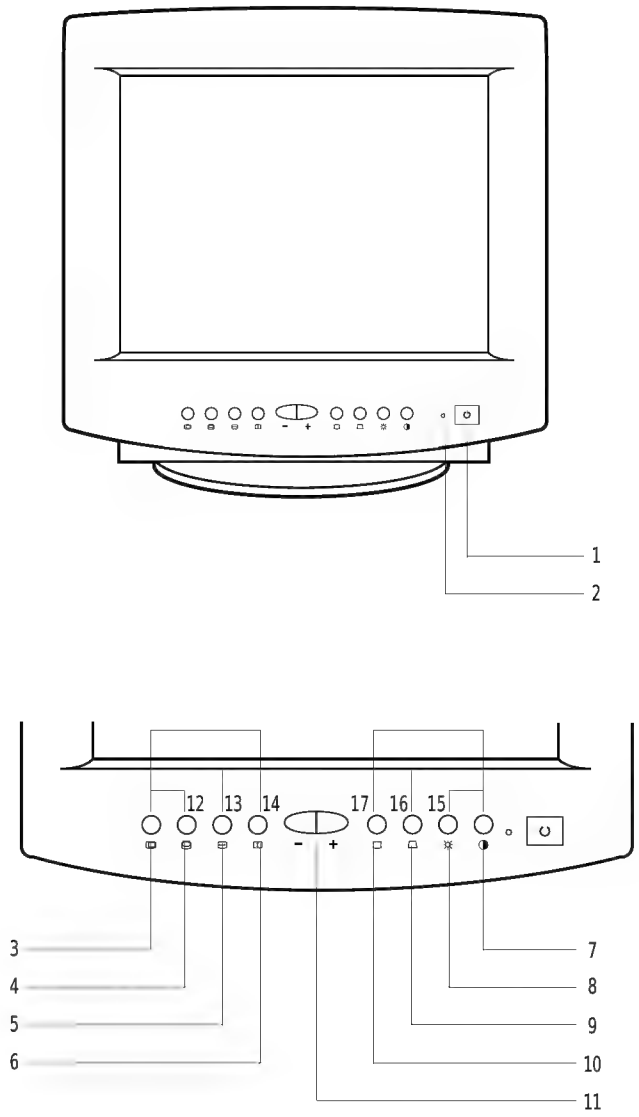



Figure 3-3. Front Control Panel

Table 3-3. Front Panel Controls

| Location | Symbol | Description |
|---|---|---|
| 1 | | Power Button |
| 2 | | Power Indicator LED (Dual Color) |
| 3 | | Horizontal Position Button |
| 4 | | Vertical Position Button |
| 5 | | Horizontal Size Button |
| 6 | | Vertical Size Button |
| 7 | | Contrast Control |
| 8 | | Brightness Control |
| 9 | | Trapezoid Button |
| 10 | | Side Pincushion Button |
| 11 | | Adjustment Buttons |
| 12 | + | Parallelogram |
| 13 | + | V-Linearity |
| 14 | + | Pinbalance Button |
| 15 | + | Degauss |
| 16 | + | Recall |
| 17 | + | User Delete |

**Note 1:** When used with a computer equipped with VESA DPMS functions, this monitor is EPA Energy Star compliant and NUTEK compliant.

Table 3-4. Display Power Management Signaling (DPMS); CKA42*7L

| State / Items | Normal Operation | Power saving function EPA/NUTEK | | |
|---|---|---|---|---|
| | | Stand-By Mode | Suspend Mode Position A | Power Off Mode Position B |
| Horizontal Sync | Active | Inactive | Active | Inactive |
| Vertical Sync | Active | Active | Inactive | Inactive |
| Video | Active | Blanked | Blanked | Blanked |
| Power Indicator | Green | Green Blinking (0.5 sec interval) | Green Blinking (1 sec interval) | Green Blinking (1 sec interval) |
| Power Consumption/hr | 73 W (max.) 55 W (nominal) | 50 W (nominal) | Less than 15 W | Less than 5 W |

Table 3-5. Display Power Management Signaling (DPMS); CKA5227L

| State / Items | Normal Operation | Power saving function EPA/NUTEK | | |
|---|---|---|---|---|
| | | Stand-By Mode | Suspend Mode Position A | Power Off Mode Position B |
| Horizontal Sync | Active | Inactive | Active | Inactive |
| Vertical Sync | Active | Active | Inactive | Inactive |
| Video | Active | Blanked | Blanked | Blanked |
| Power Indicator | Green | Green Blinking (0.5 sec interval) | Green Blinking (1 sec interval) | Green Blinking (1 sec interval) |
| Power Consumption/hr | 73 W (max.) 60 W (nominal) | 50 W (nominal) | Less than 15 W | Less than 5 W |

# 4 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the CKA42*7L/5227L monitors.

**WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.**

## 4-1 Disassembly

**Cautions:** 1. Disconnect the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

### 4-1-1 Cabinet Disassembly

1. With a pad beneath it, stand the monitor on its front with the screen facing downward and the base closest to you. Make sure nothing will damage the screen.
2. Press in the tab on the Cabinet Bottom and pull the Tilt and Swivel Base upward to remove it.
3. Working from the back of the monitor, remove the four screws and remove the Rear Cover.
4. Using pinch-nose pliers or long-nose pliers, carefully disconnect the Anode Cap from the CRT.

**Caution:** Do not touch the anode contact on the CRT.

### 4-1-2 Removing the CRT Socket PCB

1. Complete all previous steps.
2. Disconnect CRT and Main PCB ground wires on CRT Socket PCB and Shield Cover.
3. Desolder the 5 tabs on the underside of the CRT Socket PCB shield and remove the CRT Socket PCB Shield.
4. Using a knife, cut through the silicone bond and lift off the CRT Socket PCB.
5. Disconnect connectors CN102 and two ground wires on the CRT Socket PCB.

### 4-1-3 Removing the Main PCB

1. Complete all previous steps.
2. Disconnect Degaussing Coil at the CN601 connector on the Main PCB.
3. Disconnect all easily accessible ground wires on the Main PCB and Chassis Bottom.
4. Disconnect the DY connector between the DY and the CN301, CN302, CN502 and CN503 connector on the Main PCB.
5. Remove the screws on the back and along each side of the Chassis Bottom.
6. Carefully lift the Main PCB Ass'y.
7. Remove all other ground wires.

### 4-1-4 CRT Ass'y Disassembly

1. Complete all previous steps.
2. Straighten the Degaussing Coil Assembly coated metal ties and lift Coil Ass'y from the CRT.
3. Remove the four corner screws and lift the CRT up and away from the Front Cover Assembly and place it on a padded surface.

**Caution:** Do not lift the CRT by the neck.
If you will be returning this CRT to the monitor, be sure to place the CRT face downward on a protective pad.

## 4-2 Reassembly

With the CRT facing downward on a protective pad, use the steps that follow to reassemble the monitor.

### 4-2-1 Replacing the CRT

1. Loop the CRT Ground Ass'y around the back of the CRT and under the four corner metal ears. Position last the corner with the spring.
2. With the Front Cover Assembly lying face down on a protective pad, position the CRT so that the corner metal ears fit properly in the Front Cover Assembly.
3. Secure the CRT ground Ass'y and CRT at each of the four corners with the CRT screws.
4. Replace the Degaussing Coil Assembly and wrap the Coil with the plastic coated metal ties to hold the Coil in place.

### 4-2-2 Replacing the Main PCB

1. Stand the monitor on its front with the screen facing downward.
2. Slide the Main PCB into the Chassis Bottom and replace the wires and screws on the Chassis Bottom.
3. Position the Main PCB Ass'y in the front Cabinet and secure it with the screws.
4. Replace both side CRT ground wires on the Chassis Bottom.
5. Replace the Degaussing Coil at the CN601 connector on the Main PCB.
6. Replace the DY connector at the CN301, CN302, CN502 and CN503 connector on the Main PCB.
7. Replace all easily accessible ground wires on the Main PCB and Chassis Bottom.
8. Replace the Anode Cap.

### 4-2-3 Replacing the CRT Socket PCB

1. Lock the Focus (G3) wire on the CRT Socket and reconnect the Screen (G2) wire on the CRT Socket PCB.
2. Reconnect the CRT Socket on the CRT pins and apply silicon bond at the Plug/Socket Junction.
3. Replace the CRT and Main PCB ground wires on CRT Socket PCB and Shield Cover.
4. Reconnect the connectors CN102 to the CRT Socket PCB.
5. Solder the 5 tabs on the underside of the CRT Socket Shield.

### 4-2-4 Cabinet Reassembly

1. Complete all previous steps.
2. Position the Rear Cover marking sure the tabs along the front edge are properly snapped in place. Replace the four screws.
3. Snap the Tilt and Swivel Base into position.
4. Set the monitor on its Base and make sure that the CRT faceplate was not scratched or otherwise damaged.

# 5 Alignment and Adjustments

This section of the service manual explains how to make permanent adjustments to the monitor. Directions are given for adjustments using the monitor Interface Board Ver. 2.0 and software (SoftJig).

## 5-1 Adjustment Conditions

**Caution:** Changes made without the SoftJ ig are saved only to the user mode settings. As such, the settings are not permanently stored and may be inadvertently deleted by the user.

### 5-1-1 Before Making Adjustments

#### 5-1-1 (a) ORIENTATION

When servicing, always face the monitor to the east.

#### 5-1-1 (b) MAGNETIC FIELDS

Whenever possible, use magnetic field isolation equipment such as a Helmholtz field to surround the monitor. If a Helmholtz field is not available, frequently degauss the unit under test.

**Caution:** Other electrical equipment may cause external magnetic fields which may interfere with monitor performance.

Use an external degaussing coil to limit magnetic build up on the monitor. If an external degaussing coil is not available, use the internal degaussing circuit. However, do not use the internal degaussing circuit more than once per 30 minutes.

#### 5-1-1 (c) WARM-UP TIME

The monitor must be on for 30 minutes before starting alignment procedures. Warm-up time is especially critical in Color Temperature and White Balance adjustments.

#### 5-1-1 (d) SIGNAL

Analog, 0.714 Vp-p positive at 75 ohm, internal termination
Sync: Separate
(TTL level negative/positive)

#### 5-1-1 (e) SCANNING FREQUENCY

Horizontal: 30 kHz to 55 kHz (automatic)
Vertical: 50 Hz to 120 Hz (automatic)

Unless otherwise specified, adjust at the 800 x 600 mode (H : 53.7 kHz, V: 85 Hz) signals.

Refer to Table on page 2-5.

#### 5-1-1 (f) +B 13 V LINE CHECK

No beam
Contrast: Maximum
Brightness: Maximum

Check the DC 13 V ± 0.2 V at Cathode of D616 Point and GND.

#### 5-1-1 (g) HIGH VOLTAGE CHECK

No beam
Contrast: Maximum
Brightness: Maximum

Check the high voltage to 24.5 ± 0.5 kV at anode and GND.

#### 5-1-1 (i) CENTER RASTER

Adjust SW401 so that the back raster comes to the center when you apply a signal of 53.7 kHz/ 85 Hz.

#### 5-1-1 (j) BRIGHTNESS AND CONTRAST

Unless otherwise specified, adjust brightness and contrast buttons:

Brightness: Maximum
(press ⊕ button until the LED is blink)
Contrast: Maximum
(press ⊕ button until the LED is blink)

## 5-1-2 Required Equipment

The following equipment may be necessary for adjustment procedures:

5-1-2 (a) DISPLAY CONTROL ADJUSTMENT

1. Non-metallic (–) screwdriver: 1.5 mm
   Non-metallic (–) screwdriver: 3 mm
2. Philips (+) screwdriver: 1.5 mm
3. Non-metallic hexkey: 2.5 mm
4. Digital Multimeter (DMM), or
   Digital Voltmeter (DVM)
5. Signal generator, or
   Computer with a video board that uses the ET-4000 chipset (strongly recommended if using Samsung DM 200 software) and that displays: 800 x 600 @ 85 Hz, or 800 x 600 @ 75 Hz (minimum).
6. Personal computer
7. Required software: Softjig.exe from Samsung, Samsung DM200, or DisplayMate for Windows from Sonera Technologies
8. Interface Board Ver. 2.0 Code No. BH81-90001K
9. Parallel communications cable (25-pin to 25-pin); Code No. BH81-90001H
10. Signal cable (15-pin to 15-pin cable with additional 3-pin connector); Code No. BH81-90001J
11. 5 V DC adapter, not supplied

**Note:** SoftJig Assembly (includes items 8, 9 and 10 Code No. BH81-90001L

5.1-2 (b) COLOR ADJUSTMENTS

1. All equipment listed in 5-1-2 (a), above
2. Color analyzer, or any luminance measurement equipment

### 5-1-3 Connecting the SoftJig

Connect the monitor to the signal generator and/or PC as illustrated in Figures 5-1 and 5-2.

**Note:** The signal cable connector which includes the 3-wire cable must connect to the monitor. If you use Setup 2 (PC only, no signal generator) you can only make adjustments to the signal timing available on that computer system. To make corrections to all factory timings requires the use of an additional signal generator.

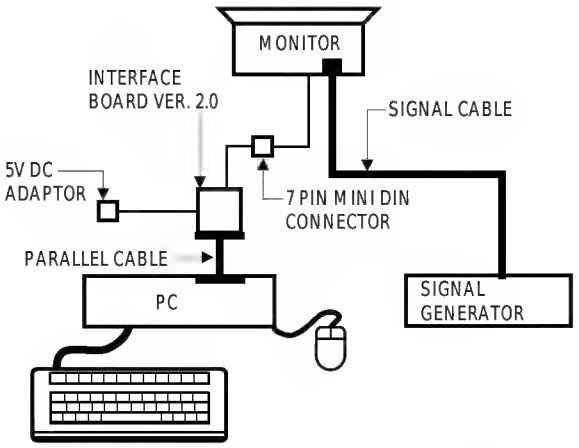



Figure 5-1 : Setup 1, With Signal Generator

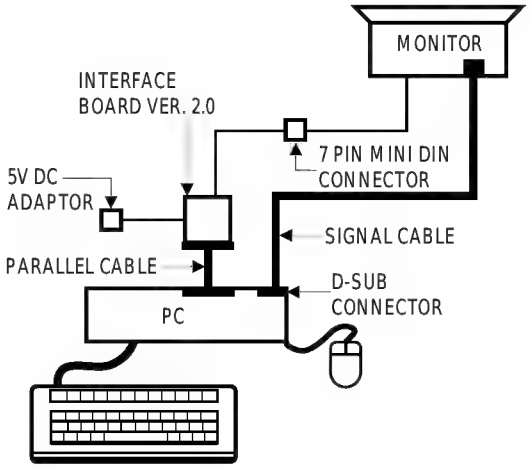



Figure 5-2. Setup 2, Without Signal Generator

### 5-1-4 After Making Adjustments

After finishing all adjustments, test the monitor in all directions. If, for example, the monitor does not meet adjustment specifications when facing north, reposition the monitor to face east and readjust. This time, try for an adjustment closer to the ideal setting within the tolerance range. Test the unit again in all directions. If the monitor again fails to meet specifications in every direction, contact your Regional After Service Center for possible CRT replacement.

# 5-2 Display Control Adjustments

## 5-2-1 Centering

Centering means to position the center point of the display in the middle of the display area. Horizontal size and position and vertical size and position control the centering of the display.

Adjust the horizontal size and vertical size to their optimal settings: 267 mm (H) x 200 mm (V) for 15", 255 mm (H) x 191 mm (V) for 14"

Adjust the horizontal position and vertical position to within 4.0 mm of the center point of the screen.

$|A - B| \leq 4.0$ mm.
$|C - D| \leq 4.0$ mm.

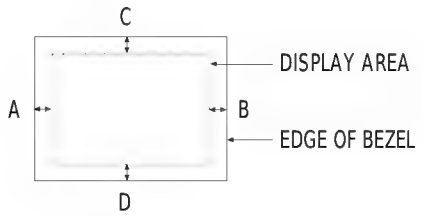



Figure 5-1. Centering

5-2-1 (a) HORIZONTAL SIZE ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz (15") |
| | 43.8 kHz/85 Hz (14") |
| Display image: | Crosshatch pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

Adjust the horizontal size of the display pattern to 267 mm (15") and 255 mm (14").
(Tolerance ± 3 mm.)

If horizontal size range cannot meet the spec adjust the VR401.

5-2-1 (b) VERTICAL SIZE ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz (15") |
| | 43.8 kHz/85 Hz (14") |
| Display image: | Crosshatch pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

Adjust the vertical size of the display pattern to 200 mm (15") and 191 mm (14").
(Tolerance: ± 3 mm.)

5-2-1 (c) HORIZONTAL POSITION ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz (15") |
| | 43.8 kHz/85 Hz (14") |
| Display image: | Crosshatch pattern |

PROCEDURE

Center the test pattern on the raster.

5-2-1 (d) VERTICAL POSITION ADJUSTMENT

CONDITIONS

| | |
|---|---|
| Scanning frequency: | 53.7 kHz/85 Hz (15") |
| | 43.8 kHz/85 Hz (14") |
| Display image: | Crosshatch pattern |

Center the test pattern on the raster.

## 5-2-2 Linearity

Linearity affects the symmetry of images as they appear on the screen. Unless each row or column of blocks in a crosshatch pattern is of equal size, or within the tolerances shown in Tables 5-1 and 5-2, an image appears distorted, elongated or squashed.

The formular of linearity (%)

$$= \frac{2 \times (Max - Min)}{Max + Min} \times 100$$

Table 5-1. Standard Modes Linearity: 800x600/85Hz

| | Standard Timing Modes | |
|---|---|---|
| | Each block (10 %) | Difference between adjacent blocks (4 %) |

Table 5-2. Other Modes Linearity: VGA, SVGA, XGA, MAC, etc.

| | Supported Timing Mode | |
|---|---|---|
| | Each block (14 %) | Difference between adjacent blocks (5 %) |

## 5-2-3 Trapezoid Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz/85 Hz (15″)
43.8 kHz/85 Hz (14″)
Display image: Crosshatch pattern

Make the the test pattern rectangular.

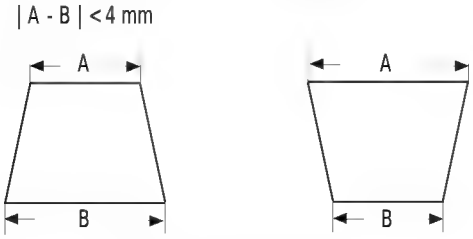



Figure 5-2. Trapezoid

## 5-2-4 Parallelogram Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz/85 Hz (15″)
43.8 kHz/85 Hz (14″)
Display image: Crosshatch pattern

To activate the Parallelogram Adjustment function, push both the Horizontal Position and Vertical Position buttons and hold them in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

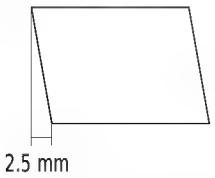



Figure 5-3. Parallelogram

## 5-2-5 Side Pincushion Adjustment

CONDITIONS

Scanning frequency: 53.7 kHz/85 Hz (15″)
43.8 kHz/85 Hz (14″)
Display image: Crosshatch pattern

After pushing the Side Pincushion button once, push the Increase (+) and Decrease (–) buttons to straighten the sides of the test pattern.

| C1 |, | C2 | ≤ 1.5 mm, | D1 |, | D2 | ≤ 1.5 mm.

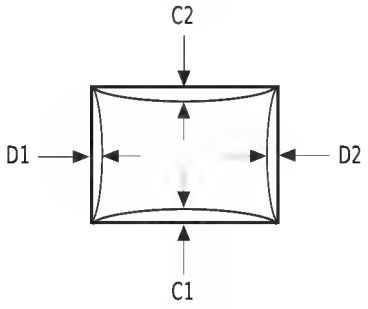



Figure 5-4. Pincushion

## 5-2-6 CRT Tilt Adjustment

TILT ADJ USTM ENT (CKA5227L With Tilt)

Push the V-Posi and H-Size simultaneously until Led blinks and back on again. Push the Increase (+) and Decrease )–) buttons to correct the Tilt.

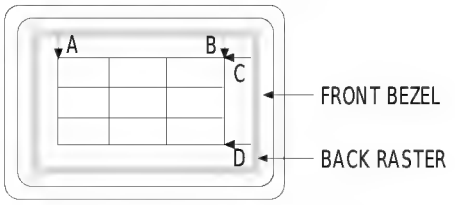



Figure 5-5. CRT Tilt Adjustment

## 5-2-7 Vertical Linearity Adjustment

To activate the vertical linearity adjustment, push both the horizontal position and horizontal size buttons and hold then in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

### 5-2-8 Pin Balance Adjustments

To activate the pin balacne function, push both the horizontal position and vertical position buttons and hold then in for longer than 3 seconds, or until the power indicator LED changes from green to blink and back to green.

Use the Increase (+) and Decrease (–) buttons to correct the display shape.

### 5-2-9 Degauss

Push the contrast and brightness buttons simultaneously. The degaussing circuit can effectively function only once per 30 minutes. If available, use an external degaussing coil during servicing.

**WARNING: Do Not hold the Degauss button down for longer than 3 seconds. If you do, it resets all of the data in the user memory area. If this occurs, you must remake the user adjustments.**

### 5-2-10 Delete User Mode Data

To delete the picture data from the user modes, push the contrast button and side pincushion button for 5 or more seconds simultaneously.

### 5-2-11 Recall

To delete the picture data from current user mode, push the contrast button and trapzoid button for 5 or more seconds simultaneoulsy.

# 5-3 Color Adjustments

**Note:** To make color adjustments you must have a color analyzer and one of the following configurations:

1. Signal Generator
   or
2. Computer with Samsung DM 200 software or DisplayMate for Windows software from Sonera Technologies
3. In case of CKA5227L, use 800 x 600 mode signal (53.7 kHz/85 Hz) for adjustments, in case of CKA42*7L, use 640 x 480 mode signal (43.8 kHz/85 Hz).

Before making adjustments, check that the video signals are as follows:

Video : Analog, 0.714 Vp-p (at 75 Ω termination)
Sync : Separate TTL level
Unless otherwise specified, use 800 x 600 mode signal (53.7 kHz/85 Hz) for adjustments.

## 5-3-1 Color Coordinates (Temperature)

Color temperature is a measurement of the radiant energy transmitted by a color. For computer monitors, the color temperature refers to the radiant energy transmitted by white. Color coordinates are the X and Y coordinates on the chromaticity diagram of wavelengths for the visible spectrum.

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″)<br>43.8 kHz/85 Hz (14″) |
| Display image: | White flat field at center of display area |
| Luminance: | Maximum |

PROCEDURE

Using the directions in sections 5-3-2 through 5-3-5, adjust the Color Coordinates for 9300° K to x = 0.283 ± 0.02 and y = 0.298 ± 0.02

## 5-3-2 Back Raster Color Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″)<br>43.8 kHz/85 Hz (14″) |
| Display image: | Back raster pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Adjust the Screen VR on the FBT so that the brightness of the Back Raster is 0.3 to 0.5 ft-L (typically 0.4 ft-L).
2. Adjust VR102R (R-Bias) and VR102B (B-Bias) so Back Raster color is white.
   (x = 0.283 ± 0.02 and y = 0.298 ± 0.02)

## 5-3-3 Video Gain Adjustment

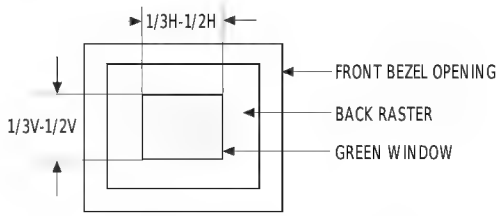



Figure 5-6. Green Box Pattern

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″)<br>43.8 kHz/85 Hz (14″) |
| Display image: | Green box pattern within range for which the ABL circuit is not active (1/3 to 1/2H and 1/3 to 1/2V). |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Adjust VR102 (G-Gain) so that the brightness of the green gain is 40 ± 1 ft-L (typically 40 ft-L).

## 5-3-4 White Balance Adjustment

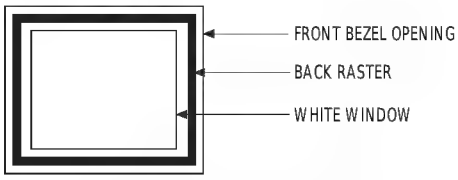



Figure 5-7. Full White Pattern

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″)<br>43.8 kHz/85 Hz (14″) |
| Display image: | Full white pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Display the full white pattern.
2. Adjust VR101 (R-Gain) and VR103 (B-Gain) so that the video is white.
   (x = 0.283 ± 0.02 and y = 0.298 ± 0.02)

## 5-3-5 White Balance Fine Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″) |
| | 43.8 kHz/85 Hz (14″) |
| Display image: | Full white pattern |
| X-Y coordinates: | x = 0.283 ± 0.02 |
| | y = 0.298 ± 0.02 |

PROCEDURE

1. Adjust the Contrast control so that the brightness of the video is about 5 ft-L.
2. Check whether the white coordinates of the video meet the specification above. If they do not, adjust them so that they do.
3. Adjust the Contrast to maximum luminance.
4. Check whether the white coordinates still meet the specification above. If they do not, adjust them so that they do.

## 5-3-6 ABL Point Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″) |
| | 43.8 kHz/85 Hz (14″) |
| Display image: | Full white pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

Adjust VR501 (ACL) so that the brightness level is 40 ± 1 ft-L.

## 5-3-7 Focus Adjustment

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″) |
| | 43.8 kHz/85 Hz (14″) |
| Display image: | "H" character pattern |
| Brightness: | Maximum |
| Contrast: | Maximum |

PROCEDURE

1. Adjust the Focus VR on the FBT to display the sharpest image possible.
2. Use Locktite to seal the Focus VR in position.

## 5-3-8 Luminance Uniformity Check

CONDITIONS

| | |
|---|---|
| Measurement instrument: | Color analyzer |
| Scanning frequency: | 53.7 kHz/85 Hz (15″) |
| | 43.8 kHz/85 Hz (14″) |
| Display image: | White flat field |
| Brightness: | Cut off point at 30 ft-L |

PROCEDURE

Measure luminance at nine points on the display screen: top left corner, top center, top right corner, center row left side, center, center row right side, bottom left corner, bottom center, and bottom right corner.

## 5-3-9 Color Purity Adjustment

Color purity is the absence of undesired color. Conspicuous mislanding (unexpected color in a uniform field) within the display area shall not be visible at a distance of 50 cm from the CRT surface.

CONDITIONS

| | |
|---|---|
| Orientation: | Monitor facing east |
| Scanning frequency: | 53.7 kHz/85 Hz (15″) |
| | 43.8 kHz/85 Hz (14″) |
| Display image: | White flat field |
| Luminance: | Cutoff point at the center of the display area |

**Caution:** Color purity adjustments should only be attempted by qualified personnel.

PROCEDURE

**For trained and experienced service technicians only.**

Use the following procedure to correct minor color purity problems:

1. Make sure the display is not affected by external magnetic fields. Use an external degaussing coil to neutralize magnetic fields which may be affecting color purity.
2. Very carefully break the glue seal between the 2-pole purity convergence magnets (PCM), the band and the spacer (see Figure 5-9).
3. Make sure the spacing between the PCM assembly and the CRT stem is 22.5 mm ± 1 mm.
4. Display a red pattern over the entire display area.
5. Adjust the Purity Magnet Rings on the PCM assembly to display a pure green pattern. (Optimal setting: x = x = 0.310 ± 0.015, y = 0.592 ± 0.015)
6. Repeat steps 4 and 5 using a red pattern and then again, using a blue pattern.

Table 5-3. Color Purity Tolerances

| | | |
|---|---|---|
| Red: | x = 0.625 ± 0.015 | y = 0.340 ± 0.015 |
| Green: | x = 0.310 ± 0.015 | y = 0.592 ± 0.015 |
| Blue: | x = 0.150 ± 0.015 | y = 0.063 ± 0.015 |

(For 9300°K white color adjustment: x = 0.283 ± 0.02, y = 0.298 ± 0.02)

7. When you have the PCMs properly adjusted, carefully gule them together with Locktite to prevent their movement during shipping.

## 5-4 Convergence Adjustments

Misconvergence occurs when one or more of the electron beams in a multibeam CRT fail to meet the other beams at a specified point.

Table 5-4. Misconvergence Tolerances

| Position | Error in mm | CRT Dot Pitch |
|---|---|---|
| Center (A) | 0.30 | 0.28 |
| Edge (B) | 0.40 | 0.28 |

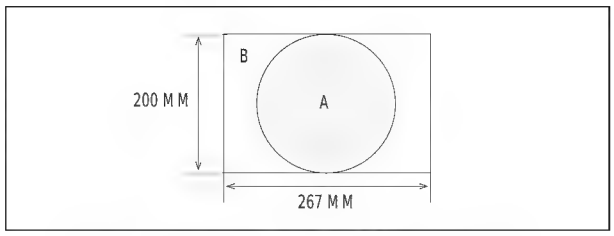
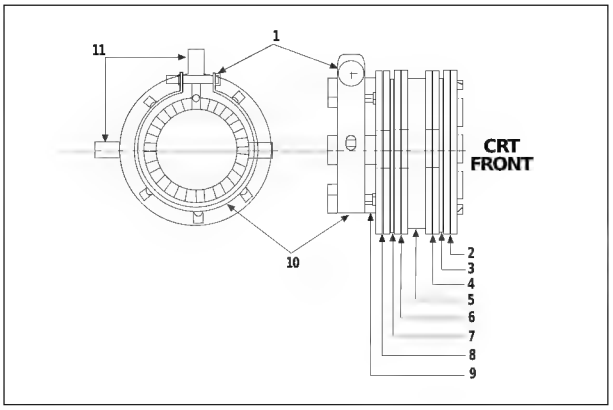


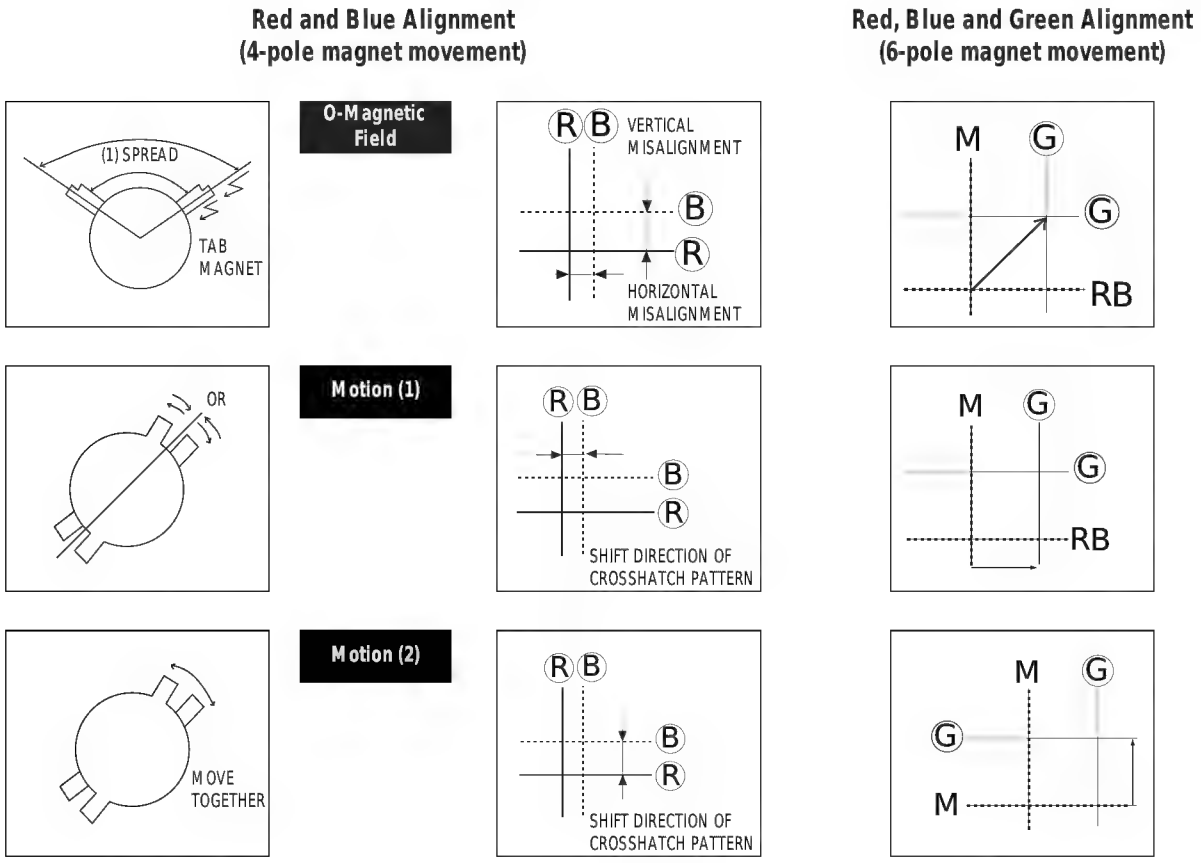

Figure 5-8. Convergence Measurement Areas




| Toshiba CRT | | | |
|---|---|---|---|
| 1 Setup Bolt | 2 Bow Magnet | 3 Spacer | 4 2-Pole Magnet |
| 5 Band | 6 6-Pole Magnet | 7 Spacer | 8 4-Pole Magnet |
| 9 Holder | 10 Band | 11 Tabs | |

Figure 5-9. Magnet Configuration

Figure 5-10. Magnet Movements



## 5-4-1 Static (Center) Convergence

Static convergence involves alignment of the red, blue and green lines in the center area of the display.
See "Dynamic Convergence" for alignment of color fields around the edges of the display.

CONDITIONS

Direction: Monitor facing east
Warm-up: 30 minutes
Display image: Crosshatch pattern
Tolerances: See Table 5-5

PROCEDURE

As shown in Figure 5-9, the CRT used in this monitor has the magnet configuration as shown in Table 5-6.

Table 5-5. Magnet Configurations

| CRT Manufacturer | Magnet Order from Front of CRT |
|---|---|
| Toshiba | Convergence bow, 2-pole, 6-pole, 4-pole |

Use the following steps to correct any static misconvergence:

1. Locate the pair of 4-pole magnet rings.
2. Unlock the rings and rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue lines.
3. Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue lines.
4. After completing the red and blue center convergence adjustment, locate the pair of 6-pole magnet rings.
5. Rotate the individual rings (change the spacing between tabs) to converge the vertical red and blue (magenta) and green lines.
6. Rotate the pair of rings (maintaining the spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Don't rotate the 2-pole magnets as they adjust for color purity.
7. Mark the correct position for the magnets and apply a small line of glue to hold the magnets in place. Lock the rings in place.

## 5-4-2 Dynamic (Edge) Convergence

CONDITIONS

Direction: Monitor facing east
Warm-up: 30 minutes
Display image: Crosshatch pattern
Tolerances: See Table 5-5

PROCEDURE

Use the following procedure to correct minor dynamic (edge) misconvergence. If, after using this procedure, dynamic misconvergence is still greater than the tolerance around the periphery of the display area, contact the Regional After Service Center for possible CRT replacement.

1. Make sure the display is not affected by external magnetic fields.
2. Make sure the static convergence is properly adjusted.
3. Strategically place small magnet rubbers on the back of the CRT to correct the misconvergence. Be careful not to remove the paper protecting the adhesive on the magnet rubbers until you are satisfied with their placement and the dynamic convergence.
4. When you are satisfied with the convergence around the edge of the CRT, permanently glue the magnet rubbers to the back of the CRT.

**WARNING: Do not remove or change the position of the factory installed wedges. These wedges were installed by the CRT manufacturer and are properly placed for this CRT; their removal may result in damage to the CRT.**

## 5-4-3 Bow Convergence Adjustments

CONDITIONS

Orientation: Monitor facing east.
Display Image: Crosshatch pattern with mixed RGB colors.
Required tools: Philips (+) screwdriver, 1.5 mm Hexkey, 2.5 mm

PROCEDURE

Bow convergence adjustments are not available for the CRTs used in the CKA42*7L/5227L monitors. While all CRTs have bow convergence magnets, they are sealed in the CRT factory and are not user or service technician adjustable. Do not touch these magnets (see Figure 5-9). If bow convergence adjustment is out of alignment, replace the CRT.

Bow misconvergence should not exceed the values listed in Table 5-5: Misconvergence Tolerances.

## 5-4-4 Balance Convergence Adjustments

Balance Convergence involves alignment of red and blue lines when they are misaligned at one end more so than at the other end. The Deflection Yoke holds the balance coils which can correct balance misconvergences.

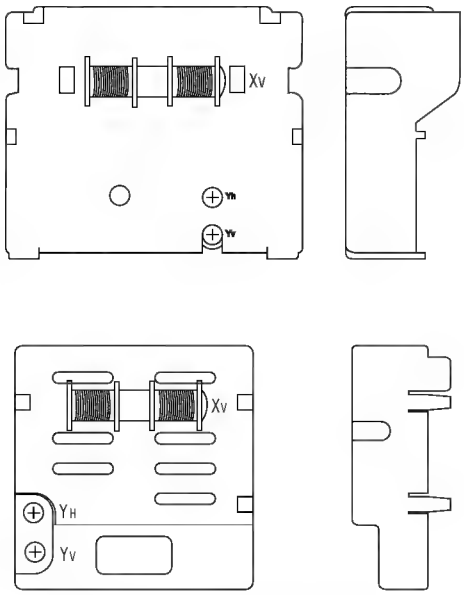



Figure 5-11. Deflection Yoke Caps

5-4-4 (a) HORIZONTAL LINE RED AND BLUE BALANCE CONVERGENCE

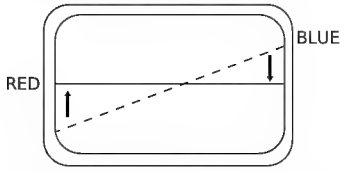



Figure 5-12. Horizontal Line Balance Misconvergence

PROCEDURE

Use a 2.5 mm hexkey at the Horizontal Balance Coil (Xv). Turning it right raises the right end of the blue line and lowers the left end. Turning the VR to the left lowers the right end of the blue line and raises the left end.

5-4-4 (b) VERTICAL RED AND BLUE BALANCE CONVERGENCE

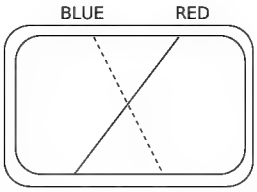



Figure 5-13. Vertical Line Balance Misconvergence

PROCEDURE

Use a 1.5 mm phillips (+) screwdriver at the YH variable resistor. Turning the VR to the left tilts the blue line to the right. Turning it right tilts the blue line to the left.

5-4-4 (c) UPPER AND LOWER HORIZONTAL LINE CONVERGENCE

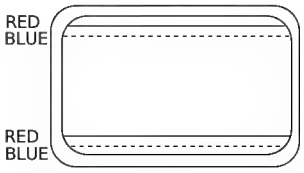



Figure 5-14. Upper and Lower Balance Misconvergence

PROCEDURE

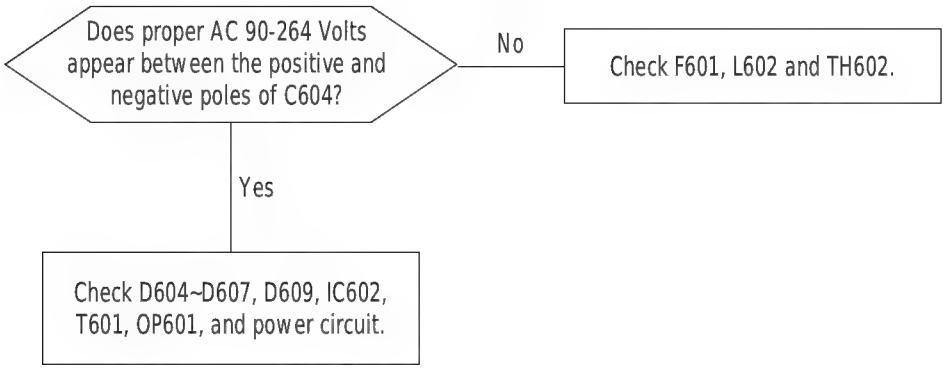
Use a 1.5 mm phillips (+) screwdriver at theYv variable resistor. Turning the VR to the left moves the blue line at the top upward and at the bottom, the line moves downward. Turning it right moves the blue line at the top downward and at the bottom the line moves upward.

# 6 Troubleshooting

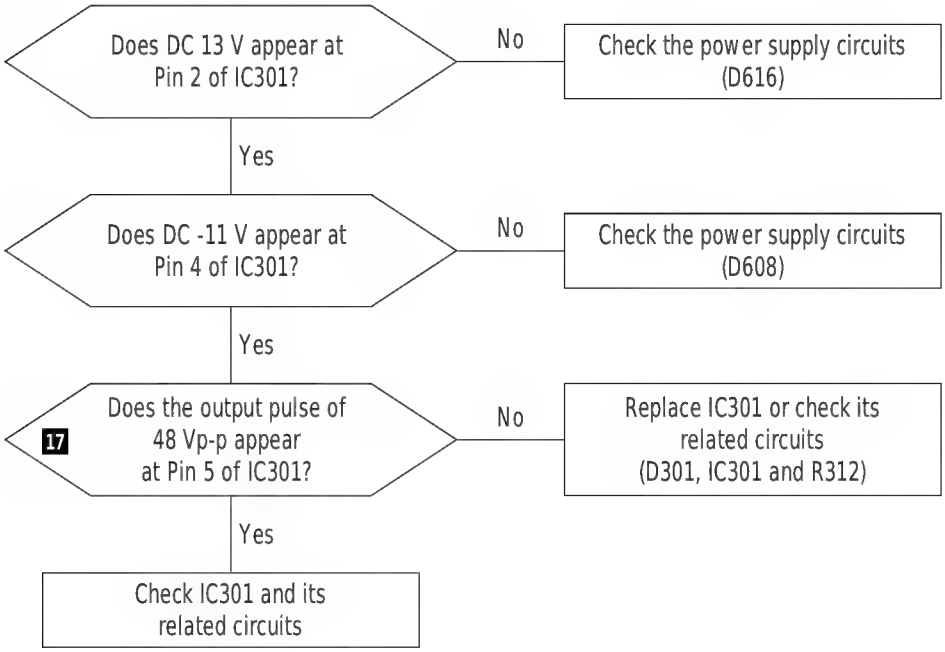
**Notes:** 1. If a picture does not appear, fully rotate the brightness and contrast controls clockwise and reinspect.

2. Check the following circuits.
   - No raster appears: Power circuit, Horizontal output circuit, H/V control circuit, and H/V output circuit.
   - High voltage develops but no raster appears: Video output circuits.
   - High voltage does not develop: Horizontal output circuits.

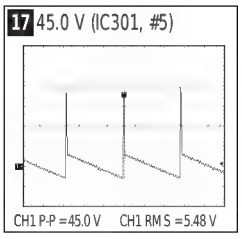
## 6-1 No Power


Does proper AC 90-264 Volts appear between the positive and negative poles of C604?
No
Check F601, L602 and TH602.
Yes
Check D604~D607, D609, IC602, T601, OP601, and power circuit.

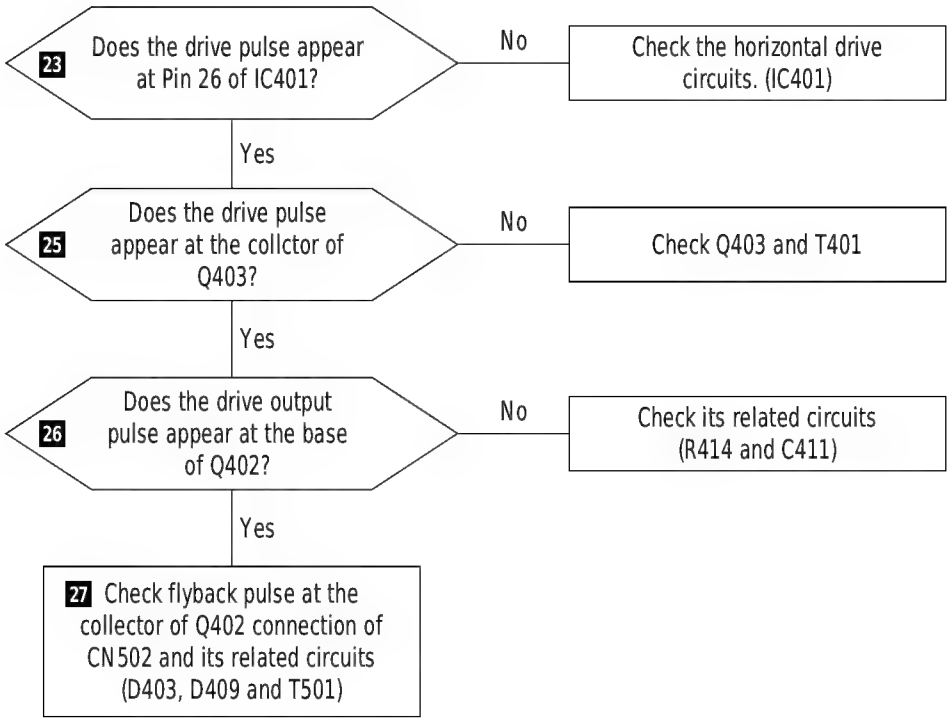
## 6-2 Horizontal Line on CRT


Does DC 13 V appear at Pin 2 of IC301?
No
Check the power supply circuits (D616)
Yes
Does DC -11 V appear at Pin 4 of IC301?
No
Check the power supply circuits (D608)
Yes
17
Does the output pulse of 48 Vp-p appear at Pin 5 of IC301?
No
Replace IC301 or check its related circuits (D301, IC301 and R312)
Yes
Check IC301 and its related circuits

**WAVEFORMS**

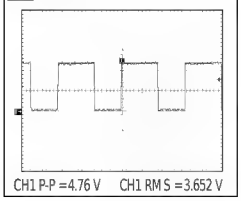


# 6-3 No Raster

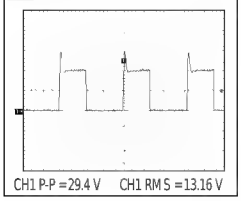

23 Does the drive pulse appear at Pin 26 of IC401?
No
Check the horizontal drive circuits. (IC401)
Yes
25 Does the drive pulse appear at the collctor of Q403?
No
Check Q403 and T401
Yes
26 Does the drive output pulse appear at the base of Q402?
No
Check its related circuits (R414 and C411)
Yes
27 Check flyback pulse at the collector of Q402 connection of CN502 and its related circuits (D403, D409 and T501)

**WAVEFORMS**

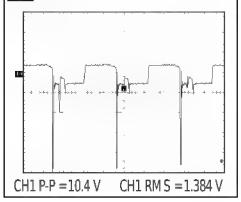
**23** 4.76 V (IC401, #26)



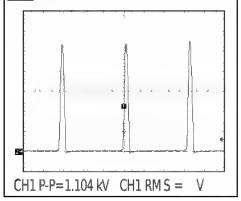

**25** 29.4 V (Q403, Collector)



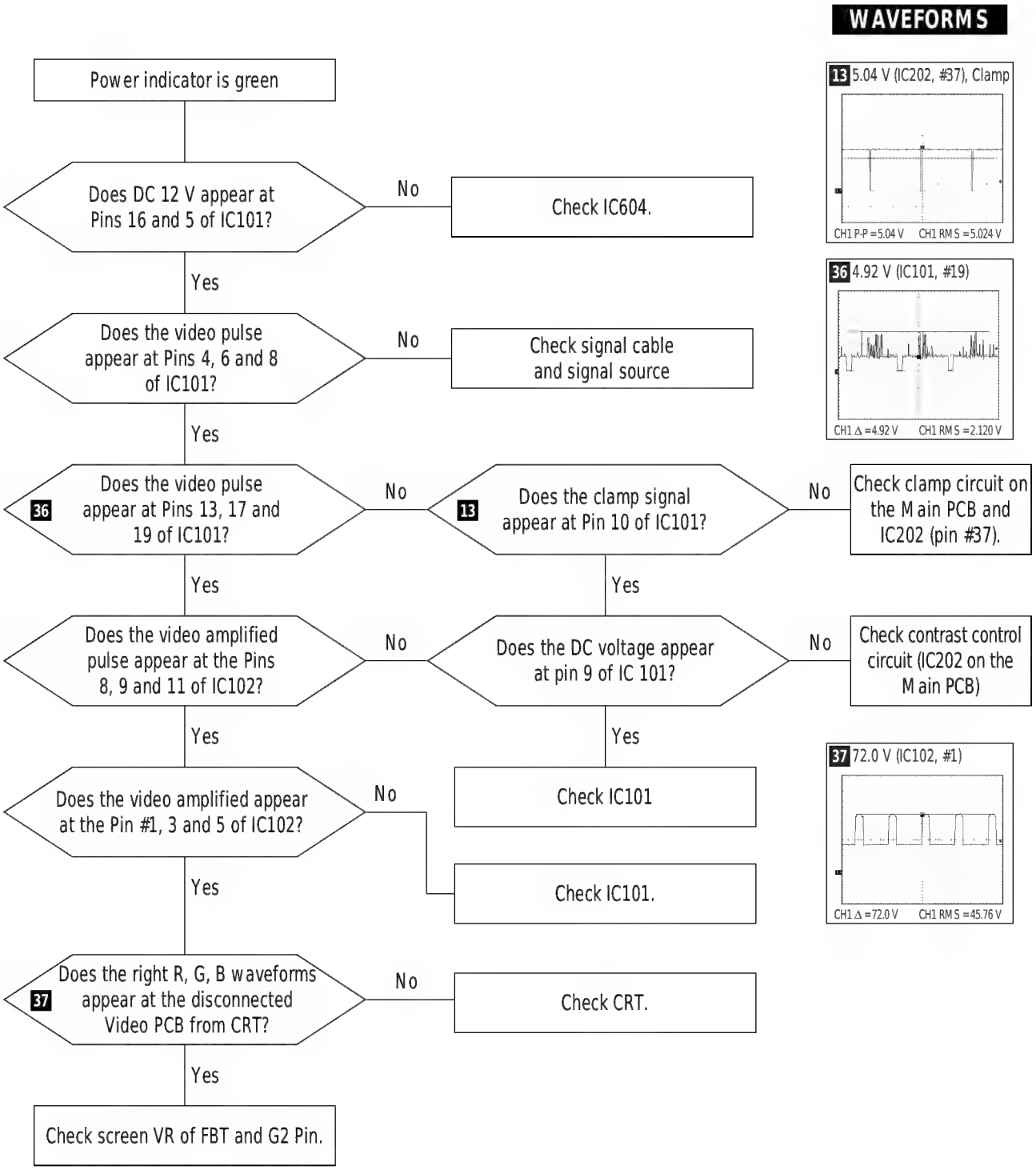

**26** 10.4 V (Q402, Base)



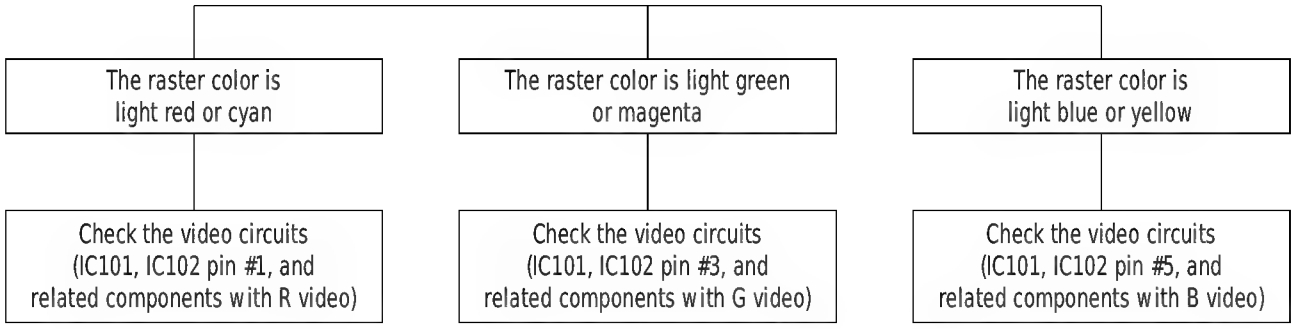

**27** 1.104 kV (Q402, Collector)



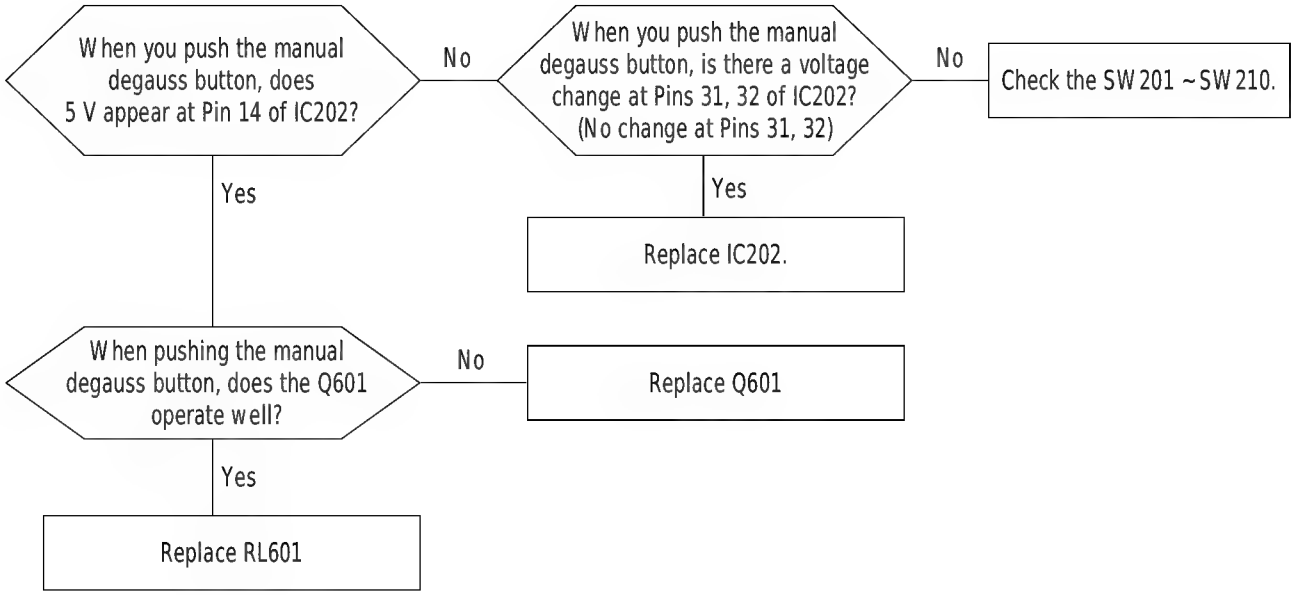
## 6-4 No Video


Power indicator is green
Does DC 12 V appear at Pins 16 and 5 of IC101?
No
Check IC604.
Yes
Does the video pulse appear at Pins 4, 6 and 8 of IC101?
No
Check signal cable and signal source
Yes
36 Does the video pulse appear at Pins 13, 17 and 19 of IC101?
No
13 Does the clamp signal appear at Pin 10 of IC101?
No
Check clamp circuit on the Main PCB and IC202 (pin #37).
Yes
Yes
Does the video amplified pulse appear at the Pins 8, 9 and 11 of IC102?
No
Does the DC voltage appear at pin 9 of IC 101?
No
Check contrast control circuit (IC202 on the Main PCB)
Yes
Yes
Does the video amplified appear at the Pin #1, 3 and 5 of IC102?
No
Check IC101
Yes
Check IC101.
37 Does the right R, G, B waveforms appear at the disconnected Video PCB from CRT?
No
Check CRT.
Yes
Check screen VR of FBT and G2 Pin.
WAVEFORMS
13 5.04 V (IC202, #37), Clamp
CH1 P-P =5.04 V CH1 RMS =5.024 V
36 4.92 V (IC101, #19)
CH1 Δ =4.92 V CH1 RMS =2.120 V
37 72.0 V (IC102, #1)
CH1 Δ =72.0 V CH1 RMS =45.76 V

## 6-5 No Specific Color Appears

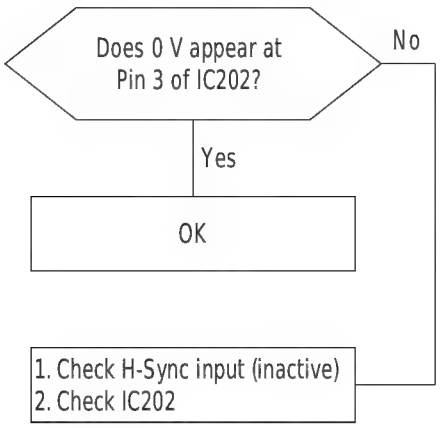

The raster color is light red or cyan
The raster color is light green or magenta
The raster color is light blue or yellow
Check the video circuits (IC101, IC102 pin #1, and related components with R video)
Check the video circuits (IC101, IC102 pin #3, and related components with G video)
Check the video circuits (IC101, IC102 pin #5, and related components with B video)

## 6-6 Degauss Operation Failure

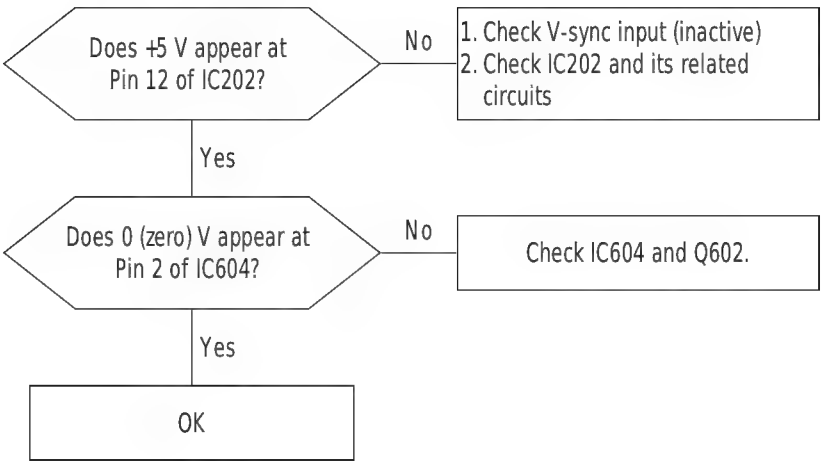

When you push the manual degauss button, does 5 V appear at Pin 14 of IC202?
No
When you push the manual degauss button, is there a voltage change at Pins 31, 32 of IC202? (No change at Pins 31, 32)
No
Check the SW201 ~ SW210.
Yes
Yes
Replace IC202.
When pushing the manual degauss button, does the Q601 operate well?
No
Replace Q601
Yes
Replace RL601

# 6-7 Power Save Management System Failure

## 6-7-1 Stand-By Mode




## 6-7-2 Suspend Mode


Does +5 V appear at Pin 12 of IC202?
No
1. Check V-sync input (inactive)
2. Check IC202 and its related circuits
Yes
Does 0 (zero) V appear at Pin 2 of IC604?
No
Check IC604 and Q602.
Yes
OK

## 6-7-3 Off Mode

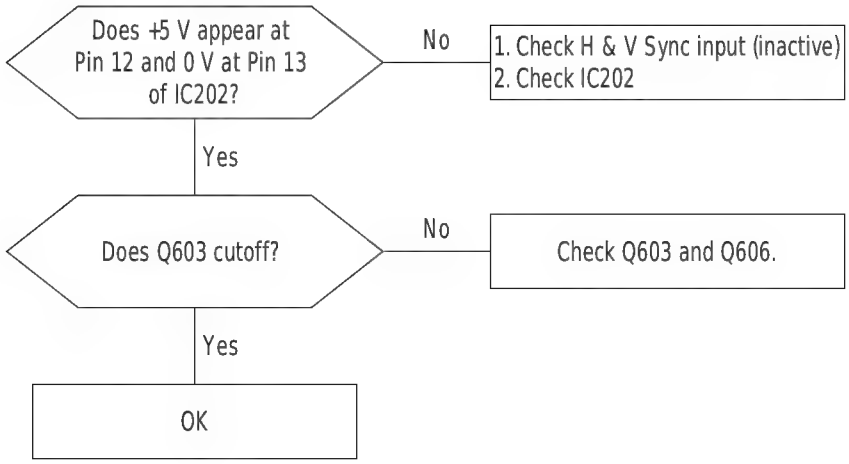



Table 6-1. DPMS Logic Table

| Mode | Sync | | Video | LED Color |
|---|---|---|---|---|
| | H | V | | |
| Normal | Active | Active | Active | Green |
| Stand-By | Inactive | Active | Blank | Green blinking |
| Suspend | Active | Inactive | Blank | Green blinking |
| Off | Inactive | Inactive | Blank | Green blinking |

**Note:** If the signal cable is removed, the DPMS function does not operate and a self raster displays.

## 6-8 User Controls Don't Work

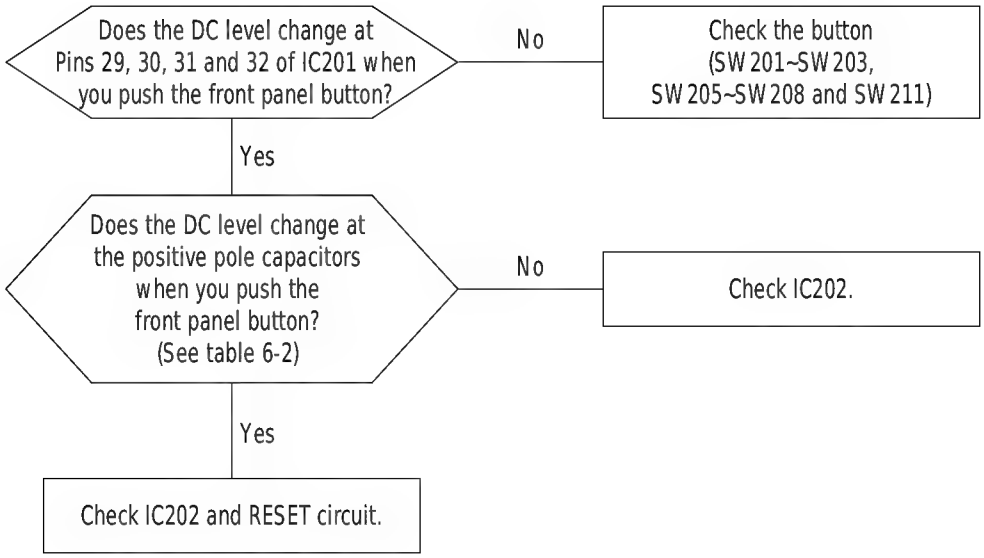
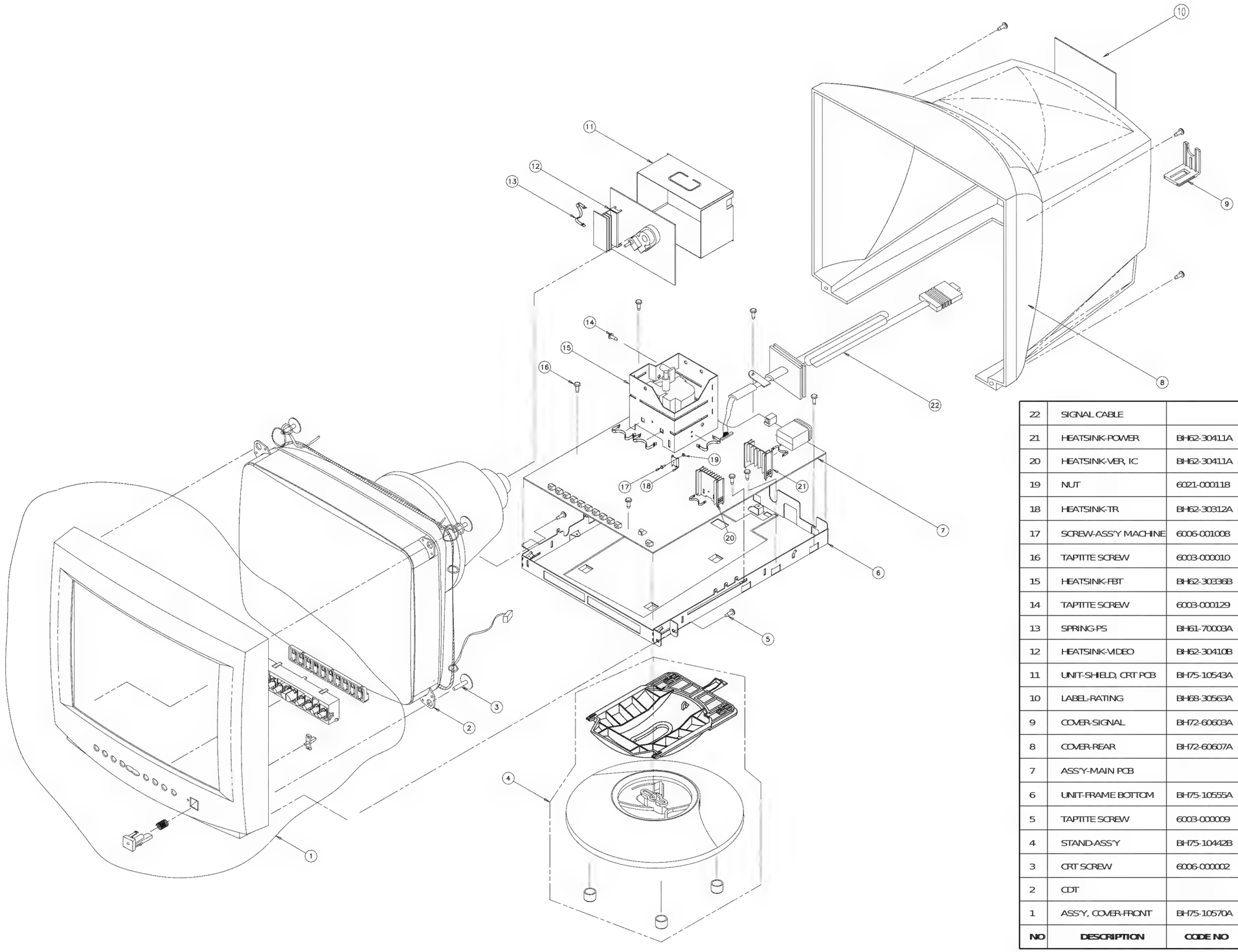

Does the DC level change at Pins 29, 30, 31 and 32 of IC201 when you push the front panel button?
No
Check the button (SW201~SW203, SW205~SW208 and SW211)
Yes
Does the DC level change at the positive pole capacitors when you push the front panel button? (See table 6-2)
No
Check IC202.
Yes
Check IC202 and RESET circuit.

Table 6-2. Front Panel Button

| Location | Function |
|---|---|
| C207 | Horizontal Size |
| C208 | Contrast |
| C209 | Brightness |

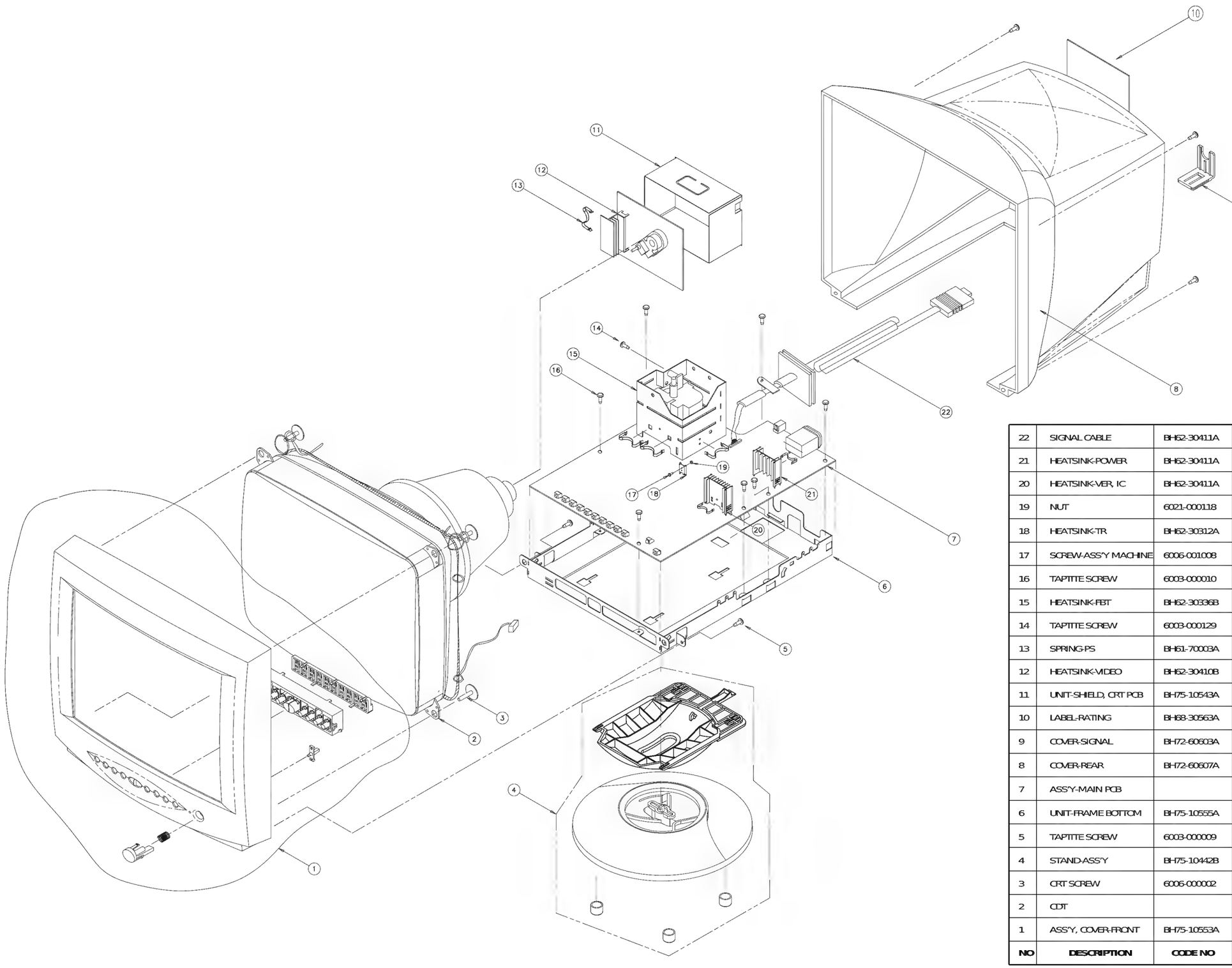
# 8 Exploded View and Parts List

## 8-1 CKA4217L



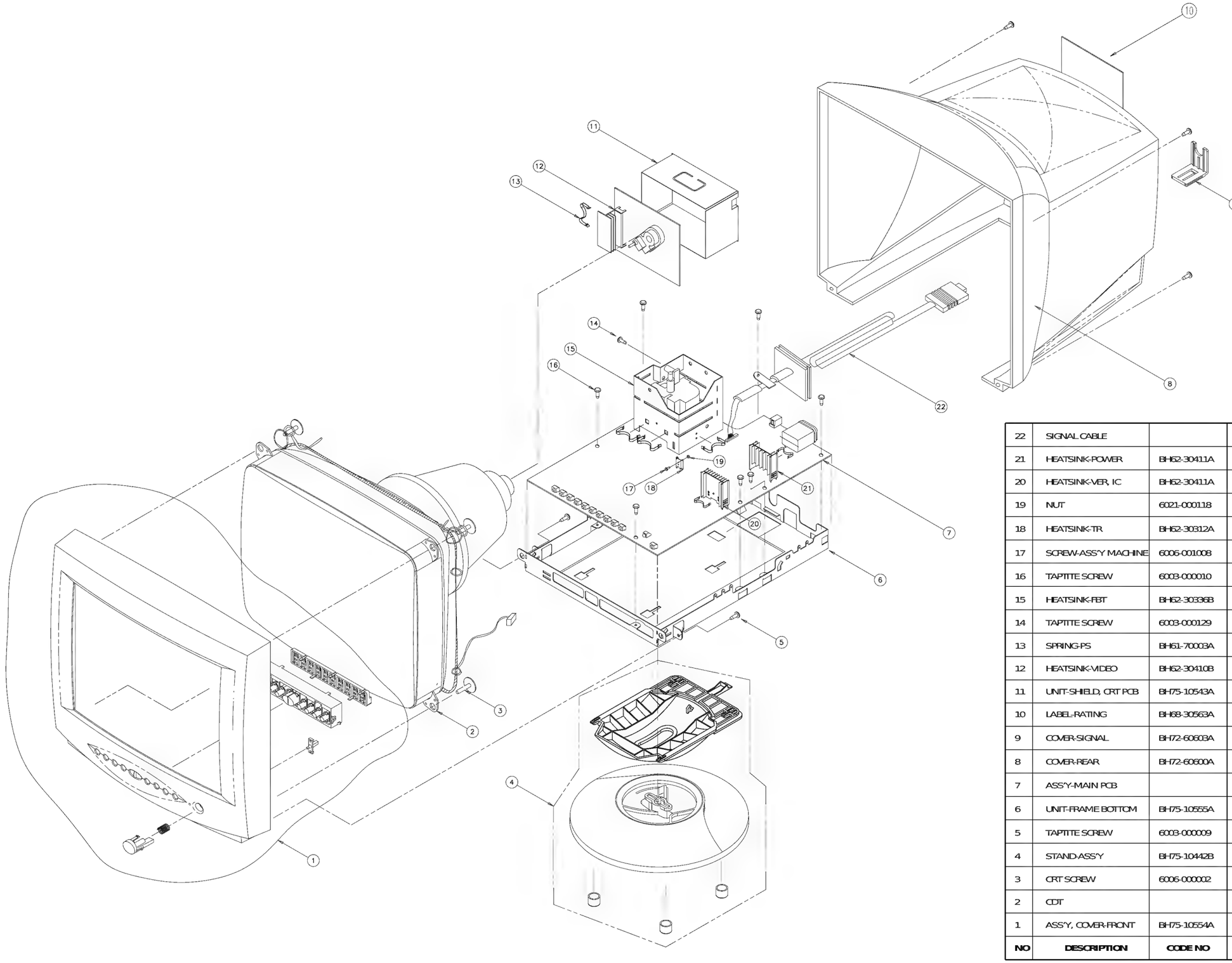

| NO | DESCRIPTION | CODE NO | SPECIFICATION | QTY | REMARK |
|---|---|---|---|---|---|
| 22 | SIGNAL CABLE | | | 1EA | |
| 21 | HEATSINK-POWER | BH62-30411A | A6030S | 1EA | |
| 20 | HEATSINK-VER, IC | BH62-30411A | A6030S | 1EA | |
| 19 | NUT | 6021-000118 | M3, SM20C | 1EA | |
| 18 | HEATSINK-TR | BH62-30312A | SPC-1, T1.0 | 1EA | |
| 17 | SCREW-ASS'Y MACHINE | 6006-001008 | M3, L10 | 1EA | |
| 16 | TAPTITE SCREW | 6003-000010 | D3, L10, W/W | 6EA | |
| 15 | HEATSINK-FBT | BH62-30336B | A1050S T=1.0 | 1EA | |
| 14 | TAPTITE SCREW | 6003-000129 | M4,L10,2PC | 1EA | |
| 13 | SPRING-PS | BH61-70003A | STS304-W1/2H-LT0.5 | 6EA | |
| 12 | HEATSINK-VIDEO | BH62-30410B | A6063S | 1EA | |
| 11 | UNIT-SHIELD, CRT PCB | BH75-10543A | SPTE T0.3 | 1EA | |
| 10 | LABEL-RATING | BH68-30563A | PE T0.075 | 1EA | |
| 9 | COVER-SIGNAL | BH72-60603A | ABS V0 IV16 | 1EA | |
| 8 | COVER-REAR | BH72-60607A | ABS V0 IV16 | 1EA | |
| 7 | ASS'Y-MAIN PCB | | | 1EA | |
| 6 | UNIT-FRAME BOTTOM | BH75-10555A | SECC, T1.0 | 1EA | |
| 5 | TAPTITE SCREW | 6003-000009 | BH, M4, L16 | 6EA | |
| 4 | STAND-ASS'Y | BH75-10442B | ABS HB IV16 | 1EA | |
| 3 | CRT SCREW | 6006-000002 | D5,L30,W/CRAMP(D18) | 4EA | |
| 2 | CDT | | | 1EA | |
| 1 | ASS'Y, COVER-FRONT | BH75-10570A | ABS, V0, IV16 | 1EA | |

## 8-2 CKA422*L




| NO | DESCRIPTION | CODE NO | SPECIFICATION | QTY | REMARK |
|---|---|---|---|---|---|
| 22 | SIGNAL CABLE | BH62-30411A | ABS, V0, IV.16 | 1EA | |
| 21 | HEATSINK-POWER | BH62-30411A | A6030S | 1EA | |
| 20 | HEATSINK-VER, IC | BH62-30411A | A6030S | 1EA | |
| 19 | NUT | 6021-000118 | M3, SM20C | 1EA | |
| 18 | HEATSINK-TR | BH62-30312A | SPC-1, T1.0 | 1EA | |
| 17 | SCREW-ASS'Y MACHINE | 6006-001008 | M3, L10 | 1EA | |
| 16 | TAPTITE SCREW | 6003-000010 | D3, L10, W/W | 6EA | |
| 15 | HEATSINK-FBT | BH62-30336B | A1050S T=1.0 | 1EA | |
| 14 | TAPTITE SCREW | 6003-000129 | M4,L10,2PC | 1EA | |
| 13 | SPRING-PS | BH61-70003A | STS304-W1/2H-LT0.5 | 6EA | |
| 12 | HEATSINK-VIDEO | BH62-30410B | A6063S | 1EA | |
| 11 | UNIT-SHIELD, CRT PCB | BH75-10543A | SPTE T0.3 | 1EA | |
| 10 | LABEL-RATING | BH68-30563A | PE T0.075 | 1EA | |
| 9 | COVER-SIGNAL | BH72-60603A | ABS V0 IV16 | 1EA | |
| 8 | COVER-REAR | BH72-60607A | ABS V0 IV16 | 1EA | |
| 7 | ASS'Y-MAIN PCB | | | 1EA | |
| 6 | UNIT-FRAME BOTTOM | BH75-10555A | SECC, T1.0 | 1EA | |
| 5 | TAPTITE SCREW | 6003-000009 | BH, M4, L16 | 6EA | |
| 4 | STAND-ASS'Y | BH75-10442B | ABS HB IV16 | 1EA | |
| 3 | CRT SCREW | 6006-000002 | D5,L30,W/CRAMP(D18) | 4EA | |
| 2 | CDT | | | 1EA | |
| 1 | ASS'Y, COVER-FRONT | BH75-10553A | ABS, V0, IV.16 | 1EA | |

## 8-3 CKA5227L




| NO | DESCRIPTION | CODE NO | SPECIFICATION | QTY | REMARK |
|---|---|---|---|---|---|
| 22 | SIGNAL CABLE | | | 1EA | |
| 21 | HEATSINK-POWER | BH62-30411A | A6030S | 1EA | |
| 20 | HEATSINK-VER, IC | BH62-30411A | A6030S | 1EA | |
| 19 | NUT | 6021-000118 | M3, SM20C | 1EA | |
| 18 | HEATSINK-TR | BH62-30312A | SPC-1, T1.0 | 1EA | |
| 17 | SCREW-ASS'Y MACHINE | 6006-001008 | M3, L10 | 1EA | |
| 16 | TAPTITE SCREW | 6003-000010 | D3, L10, W/W | 6EA | |
| 15 | HEATSINK-FBT | BH62-30336B | A1050S T=1.0 | 1EA | |
| 14 | TAPTITE SCREW | 6003-000129 | M4,L10,2PC | 1EA | |
| 13 | SPRING-PS | BH61-70003A | STS304-W1/2H,T0.5 | 6EA | |
| 12 | HEATSINK-VIDEO | BH62-30410B | A6063S | 1EA | |
| 11 | UNIT-SHIELD, CRT PCB | BH75-10543A | SPTE T0.3 | 1EA | |
| 10 | LABEL-RATING | BH68-30563A | PE T0.075 | 1EA | |
| 9 | COVER-SIGNAL | BH72-60603A | ABS V0 IV16 | 1EA | |
| 8 | COVER-REAR | BH72-60600A | ABS V0 IV16 | 1EA | |
| 7 | ASS'Y-MAIN PCB | | | 1EA | |
| 6 | UNIT-FRAME BOTTOM | BH75-10555A | SECC, T1.0 | 1EA | |
| 5 | TAPTITE SCREW | 6003-000009 | BH, M4, L16 | 6EA | |
| 4 | STAND-ASS'Y | BH75-10442B | ABS HB IV16 | 1EA | |
| 3 | CRT SCREW | 6006-000002 | D5,L30,W/CRAMP(D18) | 4EA | |
| 2 | CDT | | | 1EA | |
| 1 | ASS'Y, COVER-FRONT | BH75-10554A | ABS, V0, IV16 | 1EA | |

Memo

## 10-1-3 Main PCB Parts

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| BD101 | 306 | 167.8 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD102 | 252 | 157.5 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD103 | 252.5 | 230 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD104 | 254 | 197 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD105 | 302.8 | 154.5 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD401 | 32.5 | 157 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD402 | 134.8 | 198.5 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000G | |
| BD403 | 73 | 146.8 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD404 | 128 | 208 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD502 | 98.5 | 136.8 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD602 | 175.8 | 90.5 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD603 | 222.3 | 41 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | ⚠ |
| BD604 | 180 | 72 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD605 | 279.5 | 49.3 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD608 | 296.5 | 31 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD609 | 190 | 121.5 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD610 | 318 | 36 | 3301-000011 | MAG-CORE,FERRITE,BEAD | 1.2UH,3.5_5.7MM,10 OHM | |
| BD611 | 220.3 | 44 | 3301-000012 | CORE-FERRITE BEAD | AA,3.5x1x9mm,1000,3000G | |
| C101B | 300.8 | 137 | 2401-000028 | C-AL | 10uF,20%,50V,GP,5x11mm,5mm,TP | |
| C101G | 294.8 | 137 | 2401-000028 | C-AL | 10uF,20%,50V,GP,5x11mm,5mm,TP | |
| C101R | 278.3 | 137 | 2401-000028 | C-AL | 10uF,20%,50V,GP,5x11mm,5mm,TP | |
| C102B | 317.8 | 142.5 | 2202-002008 | C-CERAMIC,MLC-AXIAL | 10nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C102G | 317.8 | 148 | 2202-002008 | C-CERAMIC,MLC-AXIAL | 10nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C102R | 317.8 | 153.5 | 2202-002008 | C-CERAMIC,MLC-AXIAL | 10nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C103B | 294.3 | 205.5 | 2301-000010 | CAP-MYLAR,104J,2A,5P | (T)100V 104J | |
| C103G | 284 | 205.5 | 2301-000010 | CAP-MYLAR,104J,2A,5P | (T)100V 104J | |
| C103R | 304 | 232.5 | 2301-000010 | CAP-MYLAR,104J,2A,5P | (T)100V 104J | |
| C104B | 318.5 | 187 | 2401-000043 | C-AL | 1uF,20%,160V,GP,6.3x11mm,5mm,T | |
| C104G | 317 | 202 | 2401-000043 | C-AL | 1uF,20%,160V,GP,6.3x11mm,5mm,T | |
| C104R | 316.5 | 220.8 | 2401-000043 | C-AL | 1uF,20%,160V,GP,6.3x11mm,5mm,T | |
| C110 | 253.3 | 222 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C111 | 252.5 | 237.5 | 2401-000042 | C-AL | 100uF,20%,16V,GP,6.3x7mm,2.5mm | |
| C112 | 249.5 | 186.5 | 2301-000010 | CAP-MYLAR,104J,2A,5P | (T)100V 104J | |
| C113 | 249.8 | 201.3 | 2401-000033 | C-AL | 100uF,20%,100V,GP,13x20mm,5mm | |
| C114 | 269.8 | 153 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C115 | 280.8 | 153 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C116 | 285 | 157.5 | 2401-000042 | C-AL | 100uF,20%,16V,GP,6.3x7mm,2.5mm | |
| C117 | 275.3 | 153 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C118 | 316 | 164 | 2201-000526 | C-CERAMIC,DISC | 4.7nF,10%,1KV,Y5P,5x4,10,BK | |
| C119 | 265 | 166.5 | 2201-000019 | CAP-CERAMIC,103Z,2H,DISC | 10NF,500V,80-20%,Y5V,RADIAL | |
| C120 | 296.5 | 152 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C121 | 289 | 152 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C122 | 306 | 154.5 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C123 | 282.8 | 138.5 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C124 | 287 | 137 | 2401-000042 | C-AL | 100uF,20%,16V,GP,6.3x7mm,2.5mm | |
| C125 | 253.5 | 191 | 2201-000021 | C-CERAMIC,DISC | 100nF,+80-20%,50V,Y5V,8x3,5,TP | |
| C126 | 263.5 | 145.3 | 2401-000023 | CAP-AL.ELEC,105M,1H | (T)50V 1M | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| C127 | 305.3 | 141.5 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C129 | 266.5 | 146 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C201 | 36 | 41 | 2401-001166 | CAP-AL.ELEC,336M ,1C | (T)16V 33M | |
| C202 | 36.3 | 27 | 2202-002008 | C-CERAMIC,MLC-AXIAL | 10nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C203 | 30 | 71 | 2201-000017 | C-CERAMIC,DISC | 1nF,10% ,50V,Y5P,4x3.5,5,TP | |
| C204 | 30 | 67.5 | 2201-000146 | C-CERAMIC,DISC | 100pF,5% ,50V,SL,5x3.5,5,TP | |
| C205 | 46.8 | 36.5 | 2201-000011 | C-CERAMIC,DISC | 47pF,5% ,50V,NPO,6.5x3.0,5,TP | |
| C206 | 41.8 | 36.5 | 2201-000011 | C-CERAMIC,DISC | 47pF,5% ,50V,NPO,6.5x3.0,5,TP | |
| C207 | 19 | 47.3 | 2401-000050 | C-AL | 10uF,20% ,16V,GP,5x11mm,2mm,TP | |
| C208 | 28 | 31.3 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C209 | 19 | 40 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C210 | 71.8 | 43 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C211 | 75 | 43 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C212 | 79.5 | 64.5 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C213 | 43.8 | 17 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C214 | 66 | 14.5 | 2401-000050 | C-AL | 10uF,20% ,16V,GP,5x11mm,2mm,TP | |
| C215 | 68.5 | 17 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C216 | 71 | 108.5 | 2401-000050 | C-AL | 10uF,20% ,16V,GP,5x11mm,2mm,TP | |
| C217 | 65 | 109.5 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C219 | 210.5 | 102.3 | 2201-000011 | C-CERAMIC,DISC | 47pF,5% ,50V,NPO,6.5x3.0,5,TP | |
| C220 | 77.8 | 85.8 | 2401-000050 | C-AL | 10uF,20% ,16V,GP,5x11mm,2mm,TP | |
| C221 | 14 | 57.3 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C222 | 41.5 | 88.3 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C301 | 109 | 89.5 | 2305-001009 | C-FILM ,MPEF | 39nF,5% ,250V,13x9x4.5mm,7.5mm | |
| C304 | 107 | 74 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C305 | 106.5 | 41.8 | 2305-000280 | CAP-MPETP,224K,1J ,5P | (T)63V 224K | |
| C306 | 141 | 22.8 | 2401-000037 | CAP-AL.ELEC,477M ,1 | (T)470UF,16V,20%C,8x11.5,R-RADIAL | |
| C307 | 106 | 66.3 | 2401-000849 | CAP-AL.ELEC,227M ,1V | (T)35V 220M | |
| C308 | 126 | 10.5 | 2401-000037 | CAP-AL.ELEC,477M ,1C | (T)470UF,16V,20%C,8x11.5,R-RADIAL | |
| C309 | 102.5 | 54 | 2201-000013 | C-CERAMIC,DISC | 470pF,10% ,50V,Y5P,4x3.5,5,TP | |
| C310 | 106.5 | 56 | 2301-000228 | C-FILM ,PEF | 3.3nF,10% ,100V,5.8x12.5mm,5mm | |
| C311 | 101.5 | 47.8 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C312 | 92.8 | 19.5 | 2305-000001 | C-FILM ,MPEF | 470nF,10% ,63V,6.0X15.5X7.5,5mm | |
| C313 | 125.5 | 27 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C314 | 130 | 44.5 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C401 | 52 | 138.5 | 2401-000027 | C-AL | 4.7uF,20% ,50V,GP,5x11mm,5mm,TP | |
| C403 | 52 | 130 | 2301-000015 | C-FILM ,PEF | 10nF,5% ,100V,7x3.2x7mm,5mm,TP | |
| C404 | 63 | 142.3 | 2401-000031 | C-AL | 47uF,20% ,16V,GP,6.3x11mm,5mm,T | |
| C405 | 63.5 | 134.3 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C406 | 56.3 | 137.3 | 2301-000257 | C-FILM ,PEF | 4.7nF,10% ,100V,5.8x12.5mm,5mm | |
| C407 | 69 | 142.5 | 2201-000471 | C-CERAMIC,DISC | 330pF,10% ,50V,Y5P,4x3.5,5,TP | |
| C408 | 43.8 | 138 | 2301-000016 | C-FILM ,PEF | 22nF,5% ,100V,7.2x4.5x9.0mm,5mm | |
| C409 | 53.3 | 143 | 2202-002026 | C-CERAMIC,MLC-RADIAL | 1nF,5% ,50V,X7R,TP,5.1x6.4x3.2 | |
| C410 | 83.8 | 224.3 | 2201-000291 | C-CERAMIC,DISC | 1nF,10% ,500V,Y5P,8.5x5MM ,5,TP | |
| C411 | 100.5 | 229.8 | 2401-000876 | CAP-AL.ELEC,227M ,1H | (T)50V 220M | |
| C412 | 83 | 199 | 2401-000048 | CAP-AL.ELEC,476M ,1E | (T)25V 47M | |
| C413 | 62.8 | 178.5 | 2301-000012 | CAP-MYLAR,222J ,2A,5P | (T)100V 222J | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| C414 | 108 | 236 | 2303-000305 | C-FILM ,PPF | 3nF,5% ,1.6KV,29x13.5x8mm,25mm | ⚠ |
| C415 | 114.5 | 236 | 2303-000305 | C-FILM ,PPF | 3nF,5% ,1.6KV,29x13.5x8mm,25mm | ⚠ |
| C416 | 62 | 230.5 | 2305-000179 | C-FILM ,M PEF | 10nF,5% ,250V,14.5x8.8mm,10mm,B | |
| C417 | 132.8 | 229 | 2301-000133 | C-FILM ,PEF | 10nF,10% ,100V,6.5x12.5mm,5mm,T | |
| C420 | 48 | 180.5 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C421 | 75 | 137.5 | 2201-000643 | C-CERAM IC,DISC | 680pF,10% ,50V,Y5P,4x3.5,5,TP | |
| C422 | 43 | 218 | 2306-000171 | C-FILM , M PPF | 270nF,5% ,250V,21.5x12.5mm,7.5mm | 14" |
| | | | 2306-000137 | C-FILM , M PPF | 180nF,5% ,250V,19x16.5x8mm,7.5mm | 15" SDD |
| | | | 2306-000171 | C-FILM , M PPF | 270nF,5% ,250V,21.5x12.5mm,7.5mm | 15" Philips |
| C423 | 53.5 | 211 | 2306-000007 | C-FILM ,M PPF | 470nF,5% ,250V,26.5x14mm,22.5mm | 15" Philips |
| | | | 2306-000249 | C-FILM ,M PPF | 680nF,5% ,250V,26x20.5x12mm,20mm | 14" |
| | | | 2306-000197 | C-FILM ,M PPF | 390nF,5% ,250V,20x19x12mm,17.5mm | 15" SDD |
| C424 | 33.5 | 211 | 2306-000234 | C-FILM ,M PPF | 560nF,5% ,250V,26.5x15mm,22.5mm | 15" Philips |
| | | | 2306-000249 | C-FILM ,M PPF | 680nF,5% ,250V,26x20.5x12mm,20mm | 14" |
| | | | 2301-001159 | C-FILM ,M PPF | 540nF,5% ,250V | 15" SDD |
| C425 | 33 | 161.5 | 2401-000042 | C-AL | 100uF,20% ,16V,GP,6.3x7mm,2.5mm | |
| C426 | 36.5 | 163 | 2202-002009 | C-CERAM IC,M LC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C427 | 60 | 167.5 | 2301-000168 | C-FILM ,PEF | 150nF,5% ,100V,11.5x19mm,7.5mm | |
| C428 | 26 | 222.5 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C429 | 15.5 | 222.5 | 2401-000023 | CAP-AL.ELEC,105M ,1H | (T)50V 1M | |
| C430 | 61.5 | 161.5 | 2305-000001 | C-FILM ,M PEF | 470nF,10% ,63V,6.0X15.5X7.5,5mm | |
| C431 | 33 | 168.8 | 2401-000042 | C-AL | 100uF,20% ,16V,GP,6.3x7mm,2.5mm | |
| C432 | 39.5 | 163 | 2202-002009 | C-CERAM IC,M LC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C433 | 69.5 | 169 | 2202-002009 | C-CERAM IC,M LC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C434 | 73.5 | 168.8 | 2401-001509 | C-AL | 47uF,20% ,16V,GP,6.3x7mm,2.5mm | |
| C435 | 152.5 | 117 | 2401-001012 | C-ALUM INUM | 3.3UF,20% ,50V,BP,16+26.7,7.5mm,T | |
| C436 | 129 | 188 | 2303-001029 | C-FILM ,PPF | 5.2nF,5% ,630V,19x7x13,7.5,TP | |
| C437 | 155.5 | 147 | 2301-000012 | CAP-M YLAR,222J ,2A,5P | (T)100V 222J | |
| C439 | 154 | 137.8 | 2201-000010 | CAP-CERAM IC,330J ,1H,NPO | 33PF,50V,5% ,NPOPPM ,NPO,DISC | |
| C440 | 80.5 | 134.5 | 2301-000016 | C-FILM ,PEF | 22nF,5% ,100V,7.2x4.5x9.0mm,5mm | |
| C441 | 185 | 135.5 | 2301-000012 | CAP-M YLAR,222J ,2A,5P | (T)100V 222J | |
| C442 | 84 | 116 | 2201-000326 | C-CERAM IC,DISC | 2.2nF,10% ,50V,Y5P,6.3X3.0,5,TP | |
| C443 | 36 | 141.5 | 2301-000016 | C-FILM ,PEF | 22nF,5% ,100V,7.2x4.5x9.0mm,5mm | |
| C445 | 50.8 | 171.8 | 2401-000050 | C-AL | 10uF,20% ,16V,GP,5x11mm,2mm,TP | |
| C501 | 92.5 | 168.5 | 2202-002009 | C-CERAM IC,M LC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C502 | 98.8 | 150 | 2401-000966 | C-AL | 22uF,20% ,50V,GP,6.3x11mm,5mm,T | |
| C503 | 170.5 | 119.5 | 2305-000004 | C-FILM ,M PEF | 220nF,10% ,100V,12.7x16,5mm,TP | |
| C504 | 85.5 | 174.5 | 2202-002009 | C-CERAM IC,M LC-AXIAL | 100nF,+80-20% ,50V,Y5V,2.3X3.0 | |
| C505 | 170.5 | 126 | 2305-000004 | C-FILM ,M PEF | 220nF,10% ,100V,12.7x16,5mm,TP | |
| C507 | 219 | 205.3 | 2201-000017 | C-CERAM IC,DISC | 1nF,10% ,50V,Y5P,4x3.5,5,TP | |
| C508 | 207.5 | 144.5 | 2401-000046 | CAP-AL.ELEC,106M ,2E | (T)250V 10M | |
| C509 | 203.5 | 241 | 2401-001334 | C-AL | 470nF,20% ,50V,GP,5x11mm,2mm,TP | |
| C511 | 117.5 | 149 | 2201-000469 | C-CERAM IC,DISC | 330pF,10% ,500V,Y5P,6x3.5,5,TP | |
| C512 | 130 | 137.5 | 2306-000007 | C-FILM ,M PPF | 470nF,5% ,250V,26.5x14mm,22.5mm | |
| C515 | 186.8 | 125.8 | 2201-000017 | C-CERAM IC,DISC | 1nF,10% ,50V,Y5P,4x3.5,5,TP | |
| C516 | 186.8 | 129.5 | 2201-000471 | C-CERAM IC,DISC | 330pF,10% ,50V,Y5P,4x3.5,5,TP | |
| C517 | 140 | 91 | 2401-000033 | C-AL | 100uF,20% ,100V,GP,13x20mm,5mm | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| C518 | 175 | 139 | 2401-000027 | C-AL | 4.7uF,20%,50V,GP,5x11mm,5mm,TP | |
| C519 | 235.3 | 162.3 | 2401-000010 | C-AL | 220uF,20%,16V,GP,6.3x11mm,2.5m | |
| C520 | 215.5 | 224.8 | 2202-002008 | C-CERAMIC,MLC-AXIAL | 10nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C601 | 60 | 11 | 2401-000037 | CAP-AL.ELEC,477M,1C | (T)470UF,16V,20%C,8x11.5,R-RADIAL | |
| C602 | 51 | 18.3 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C604 | 282.5 | 45.3 | 2201-000024 | C-CERAMIC,DISC | 4.7nF,20%,250VAC,Y5U,16x7,7.5 | ⚠ |
| C605 | 269 | 45.3 | 2201-000024 | C-CERAMIC,DISC | 4.7nF,20%,250VAC,Y5U,16x7,7.5 | ⚠ |
| C606 | 267.5 | 36.5 | 2501-000203 | CAP-MPAPER,474K,250VAC | 470NF,250VAC,10%,X2,RE-RAD | ⚠ |
| C607 | 296.3 | 16.5 | 2201-000024 | C-CERAMIC,DISC | 4.7nF,20%,250VAC,Y5U,16x7,7.5 | ⚠ |
| C608 | 290 | 19 | 2201-000024 | C-CERAMIC,DISC | 4.7nF,20%,250VAC,Y5U,16x7,7.5 | ⚠ |
| C610 | 168 | 14 | 2301-000012 | CAP-MYLAR,222J,2A,5P | (T)100V 222J | |
| C611 | 177.5 | 24 | 2301-000287 | CAP-MYLAR,562J,2A,5P | (T)100V 562J | |
| C612 | 163.5 | 83.5 | 2401-000033 | C-AL | 100uF,20%,100V,GP,13x20mm,5mm | |
| C613 | 226 | 15.5 | 2301-000018 | C-FILM,PEF | 47nF,5%,100V,8.5x12.5mm,5mm,TP | |
| C614 | 220.5 | 15.5 | 2305-000004 | C-FILM,MPEF | 220nF,10%,100V,12.7x16,5mm,TP | |
| C615 | 162.5 | 23 | 2401-000039 | CAP-AL.ELEC,108M.1C,10x16 | (T)1000UF,16V,20%,R-RADIAL | |
| C616 | 169.5 | 28 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C617 | 245.8 | 91.8 | 2401-000052 | CAP-AL.ELE,227M,2G,30X35 | (B)220UF,400V,20%,R-RADIAL | ⚠ |
| C618 | 255.8 | 16.6 | 2201-000020 | C-CERAMIC,DISC | 10nF,10%,1KV,Y5P,20x5,10,BK | |
| C619 | 150 | 28.5 | 2201-000016 | C-CERAMIC,DISC | 2.2nF,10%,500V,Y5P,8x4,5,TP | |
| C620 | 147 | 37.5 | 2401-000033 | C-AL | 100uF,20%,100V,GP,13x20mm,5mm | |
| C621 | 162.5 | 59.5 | 2201-000291 | C-CERAMIC,DISC | 1nF,10%,500V,Y5P,8.5x5MM,5,TP | |
| C622 | 160 | 68 | 2401-000038 | C-AL | 470uF,20%,25V,GP,10x12.5mm,5mm | |
| C623 | 251.5 | 64 | 2401-001195 | CAP-AL.ELEC,336M,1H | (T)50V 33M | |
| C624 | 251.8 | 48.5 | 2301-000010 | CAP-MYLAR,104J,2A,5P | (T)100V 104J | |
| C625 | 251.5 | 36.8 | 2201-000365 | C-CERAMIC,DISC | 220pF,10%,2KV,Y5P,6.3X3.0,5,TP | |
| C626 | 233.3 | 72.3 | 2401-000023 | CAP-AL.ELEC,105M,1H | (T)50V 1M | |
| C627 | 176 | 52.5 | 2401-000039 | CAP-AL.ELEC,108M.1C,10x16 | (T)1000UF,16V,20%,R-RADIAL | |
| C628 | 28.3 | 177.3 | 2202-002009 | C-CERAMIC,MLC-AXIAL | 100nF,+80-20%,50V,Y5V,2.3X3.0 | |
| C629 | 48 | 187.3 | 2401-000042 | C-AL | 100uF,20%,16V,GP,6.3x7mm,2.5mm | |
| C630 | 202.8 | 72 | 2201-000024 | C-CERAMIC,DISC | 4.7nF,20%,250VAC,Y5U,16x7,7.5 | |
| C631 | 196.5 | 79.3 | 2201-000024 | C-CERAMIC,DISC | 4.7nF,20%,250VAC,Y5U,16x7,7.5 | |
| C632 | 159.5 | 41.5 | 2401-000039 | CAP-AL.ELEC,108M.1C,10x16 | (T)1000UF,16V,20%,R-RADIAL | |
| C633 | 147.5 | 59.5 | 2401-000031 | C-AL | 47uF,20%,16V,GP,6.3x11mm,5mm,T | |
| C634 | 219.5 | 71 | 2301-000010 | CAP-MYLAR,104J,2A,5P | (T)100V 104J | |
| C636 | 168 | 47 | 2201-000469 | C-CERAMIC,DISC | 330pF,10%,500V,Y5P,6x3.5,5,TP | |
| CN101 | 247 | 134 | 3711-003240 | CONNECTOR-HEADER | BOX,15P,1R,2.5mm,STRAIGHT,SN | |
| CN102 | 265 | 179.5 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN103 | 323 | 165 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN201 | 224 | 115.8 | 3711-003594 | CONNECTOR-HEADER | BOX,13P,1R,2mm,STRAIGHT,SN | |
| CN202 | 224 | 124.3 | 3711-003240 | CONNECTOR-HEADER | BOX,15P,1R,2.5mm,STRAIGHT,SN | |
| CN301 | 118.5 | 184.5 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN302 | 118.5 | 176.5 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN303 | 91.5 | 13.5 | 3711-000024 | CONNECTOR-HEADER | BOX,3P,1R,2.5mm,STRAIGHT,SN | |
| CN502 | 118.5 | 203 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN503 | 118.5 | 192.5 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN504 | 185 | 238 | 3711-000024 | CONNECTOR-HEADER | BOX,3P,1R,2.5mm,STRAIGHT,SN | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| CN601 | 305 | 97 | 3711-000217 | CON-WALL HEADER,3P,3.96 | STRAIGHT,1WALL | |
| CN602 | 272.5 | 77 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN603 | 265 | 77 | BH71-40300A | PIN-HINGE | BRASS,D2.36,SN,HEAT/SINK | |
| CN604 | 311.5 | 74.8 | 3722-001100 | JACK-DIN | 4P/2C,6mm,AG,BLK,NO | |
| CN606 | 300.3 | 82 | 3711-000178 | CONNECTOR-HEADER | 1WALL,2P,1R,3.96mm,STRAIGHT,SN | |
| CRT1 | 282.8 | 188 | BH03-10301G | CRT,COLOR,14 | M34KUK35X01 | |
| D101 | 258.5 | 153 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D101B | 274 | 219.5 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D101G | 269 | 219.5 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D101R | 266.5 | 219.5 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D102B | 281.5 | 230.5 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D102G | 286.5 | 230.5 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D102R | 291.5 | 230.5 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D103B | 313.5 | 194 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D103G | 312 | 210.3 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D103R | 313.3 | 230.8 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D205 | 228.5 | 130 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D206 | 231 | 130 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D207 | 233.5 | 130 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D208 | 237.5 | 126.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D209 | 237.5 | 124 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D210 | 237.5 | 121.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D211 | 214.5 | 109.5 | 0403-000005 | DIODE-ZEN,UZ-5.1B,DO-35 | 0.5W,10MA | |
| D213 | 227.5 | 107 | 0403-000005 | DIODE-ZEN,UZ-5.1B,DO-35 | 0.5W,10MA | |
| D214 | 259.5 | 117.3 | 0403-000005 | DIODE-ZEN,UZ-5.1B,DO-35 | 0.5W,10MA | |
| D215 | 259.5 | 114.8 | 0403-000005 | DIODE-ZEN,UZ-5.1B,DO-35 | 0.5W,10MA | |
| D216 | 66.5 | 134.3 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D301 | 130.5 | 41 | 0402-000128 | DIODE-REC,1N4002,DO-41 | 70V,1A,1.1V,1A,2000NS,0.5A | |
| D401 | 80 | 230 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D402 | 72.5 | 232.1 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D403 | 135.5 | 207.8 | 0404-000001 | DIODE-SCHOTTKY | FMP-G2FS,1500V,5A,TO-220,ST | |
| D404 | 66.5 | 221.3 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D405 | 71.3 | 178.8 | 0402-000128 | DIODE-REC,1N4002,DO-41 | 70V,1A,1.1V,1A,2000NS,0.5A | |
| D406 | 26.5 | 206 | 0402-000006 | DIODE-RECTIFIER | 1N4007GP,1000V,1A,DO-41 | |
| D407 | 16 | 206 | 0402-000006 | DIODE-RECTIFIER | 1N4007GP,1000V,1A,DO-41 | |
| D408 | 121 | 232 | 0402-001112 | DIODE-RECTIFIER | MDV04-600,600V,4A,DO201,BK | |
| D409 | 127.3 | 234.3 | 0402-001025 | DIODE-RECTIFIER | ERD07-15,1500V,1.5A | |
| D410 | 40.5 | 139 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D411 | 61 | 188.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D412 | 61 | 134.3 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D413 | 58.5 | 126.3 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D414 | 138.5 | 186.5 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D418 | 58.3 | 206.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D501 | 116 | 133.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D502 | 187 | 120.3 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D503 | 187 | 122.8 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D507 | 213 | 155.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| D509 | 210.5 | 155.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D510 | 225.8 | 173.8 | 0402-000006 | DIODE-RECTIFIER | 1N4007GP,1000V,1A,DO-41 | |
| D513 | 212.8 | 137.8 | 0401-000006 | DIODE-SWITCHING | BAV21,200V,250mA,400mW,50nS,DO | |
| D514 | 176.5 | 232.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D515 | 118.5 | 152.5 | 0402-000014 | DIODE-RECTIFIER | RG2,400V,1.2A,DO-201 | |
| D516 | 197 | 135 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D517 | 190 | 125 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D518 | 203.5 | 231.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D519 | 95 | 157.8 | 0403-000337 | DIODE-ZENER | UZ24BH,24V,24.2-25.7V,500mW,DO | |
| D602 | 286 | 117 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D603 | 220.5 | 18.5 | 0403-000351 | AM DIODE-ZEN,UZ-4.7B | ST 02169-403-420 | |
| D604 | 292.3 | 79 | 0402-000008 | DIODE-REC,1N5399GP,DO-15 | 1000V,1.4V,1.5A,2US | |
| D605 | 260 | 58 | 0402-000008 | DIODE-REC,1N5399GP,DO-15 | 1000V,1.4V,1.5A,2US | |
| D606 | 260 | 51.3 | 0402-000008 | DIODE-REC,1N5399GP,DO-15 | 1000V,1.4V,1.5A,2US | |
| D607 | 288 | 74.8 | 0402-000008 | DIODE-REC,1N5399GP,DO-15 | 1000V,1.4V,1.5A,2US | |
| D608 | 173 | 28 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D609 | 271 | 64 | 0402-000008 | DIODE-REC,1N5399GP,DO-15 | 1000V,1.4V,1.5A,2US | |
| D610 | 169.5 | 31.5 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D611 | 185 | 31.5 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D612 | 186 | 68.3 | 0402-000005 | DIODE-RECTIFIER | 31DF4,400V,3A,DO-201AD | |
| D613 | 222.3 | 33.8 | 0402-000017 | DIODE-RECTIFIER | RGP02-12,1200V,0.5A,DO-204AL | |
| D614 | 222.5 | 53 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| D615 | 186 | 62.8 | 0402-000005 | DIODE-RECTIFIER | 31DF4,400V,3A,DO-201AD | |
| D616 | 185.5 | 36.5 | 0402-000014 | DIODE-RECTIFIER | RG2,400V,1.2A,DO-201 | |
| D617 | 182.5 | 41.5 | 0402-000247 | DIODE-RECTIFIER | RG2Y,70V,1.5A,DO-201 | |
| D618 | 231 | 79.5 | 0401-000005 | DIODE-SIG,1N4148,DO-35 | 75V,150MA,1V,10MA | |
| D619 | 256.8 | 44.8 | 0402-000017 | DIODE-RECTIFIER | RGP02-12,1200V,0.5A,DO-204AL | |
| D620 | 167 | 57.5 | 0402-000007 | DIODE-REC,1N4937,DO-41 | 420V,1A,1.2V,1A,200NS,1A | |
| EY101 | 298.4 | 229.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY102 | 247.6 | 229.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY103 | 247.6 | 211.4 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY104 | 298.4 | 211.4 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY14 | 303.3 | 36 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY301 | 114.4 | 23.4 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY302 | 132.6 | 23.4 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY401 | 108 | 236 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY402 | 114.5 | 236 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY403 | 33.5 | 211 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY404 | 53.5 | 211 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY405 | 134.3 | 168.8 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY406 | 92.5 | 220.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY501 | 150 | 150.9 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY502 | 198 | 150.9 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY503 | 223.4 | 231.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY504 | 146.5 | 236.9 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY505 | 176.8 | 166.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY506 | 202.3 | 182.8 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| EY507 | 176.7 | 195.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY508 | 188 | 166.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY509 | 135.5 | 202.7 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY510 | 110.5 | 117.3 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY511 | 197.5 | 204.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY512 | 175.5 | 204.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY601 | 217.5 | 31.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY602 | 192.5 | 56.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY603 | 192.5 | 36.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY604 | 217.5 | 46.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY605 | 225 | 67.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY606 | 132.6 | 70.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY607 | 143 | 127.5 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY608 | 243.2 | 67.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY609 | 114.4 | 70.6 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY610 | 225 | 20.4 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY611 | 278.5 | 27 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY612 | 243.2 | 20.4 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY613 | 292.3 | 55.8 | 6042-000002 | EYELET | EYELET 1.5 HOLE 2.2 PAD 4.0 | |
| EY614 | 245.8 | 91.8 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| EY615 | 245.8 | 81.8 | 6042-000001 | EYELET | EYELET 2.2 HOLE 3.0 PAD 5.0 | |
| FG601 | 295 | 10 | 3601-000004 | FUSE-FERRULE | 250V,3.15A,SLOW BLOW,CERAMIC,5 | ⚠ |
| FH601 | 305.3 | 9.8 | 3602-000001 | FUSE-CLIP,5.2X20,30M OHM | 800GF,400-800GF | |
| HS102 | | | BH62-30410A | HEAT/SINK | A6063S,T2.5 | |
| HS301 | | | BH62-30411A | HEAT/SINK | A6063S,T2.0 | |
| HS501 | | | BH62-30417A | HEAT/SINK-FBT | A1050S,T1.0,CKA42*7/5227 | ⚠ |
| HS508 | | | BH62-30015A | HEAT/SINK-TR | SCP-1,T1,SN | |
| HS602 | | | BH62-30411A | HEAT/SINK | A6063S,T2.0 | ⚠ |
| IC101 | 274.5 | 141 | 1201-001184 | IC-VIDEO AMP | 2141,DIP,20P,300MIL,SINGLE,P | ⚠ |
| IC102 | 281.5 | 241 | 1204-000010 | IC-CHANNEL SELECTOR | LM 2406,T0-220,11P,PLASTIC,85 | ⚠ |
| IC201 | 38 | 32 | 1203-001274 | IC-VOL. DETECTOR | 7545,TO-92,3P,PLASTIC,4.35/4 | |
| IC202 | 34 | 48.5 | BH09-10303T | IC-MICOM MASKING | CKA,LSC442839B,SYNC-PROCESSOR | ⚠ |
| IC203 | 80 | 19.5 | 1103-001020 | IC-EEPROM | 24LC04,4Kx8BIT,DIP,8P,300MIL | |
| IC204 | 63.5 | 122 | 1103-001009 | IC-EEPROM | 24LC21,128X8BIT,DIP,8P,300MIL | ⚠ |
| IC301 | 112 | 50.8 | 1204-000013 | IC-VERTICAL PROCESSO | TDA9302H,TO-220,9P,PLASTIC,3 | ⚠ |
| IC302 | 92.5 | 25.5 | 1201-001034 | IC-AMPLIFIER | L272M,DIP,8P,28V,1A,1W,STICK | |
| IC401 | 40 | 146.8 | 1204-001231 | IC-DEF. PROCESSOR | TDA9109,DIP,32P,300MIL,PLASTIC | ⚠ |
| IC601 | 183 | 9.5 | 1203-000002 | IC-LIN,431,REGULATOR | TO-92,3,36V(T)-SIMPLE | |
| IC602 | 246 | 38 | BH13-10334H | IC | G-PROJECT, KA2H0880, SIP, 5P, FET | |
| IC603 | 73.8 | 8 | 1203-000001 | IC-POSI.ADJUST REG. | 7805,TO-220,3P,PLASTIC,4.8/5 | |
| IC604 | 31 | 177.5 | 1203-000165 | IC-LIN,KA78R12,REGULATOR | TO-220,4,5V | |
| IS601 | 303.3 | 29 | 3721-001006 | PLUG-AC POWER | 3P,10/24mm,SN | ⚠ |
| J 14 | | | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | 14" |
| J 15 | | | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | 15" SDD |
| JP209 | | | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | 14" |
| L101B | 287 | 200.8 | 2701-001036 | INDUCTOR-AXIAL | 1.2uH,10%,9.8x4.2mm | |
| L101G | 274.3 | 206.5 | 2701-001036 | INDUCTOR-AXIAL | 1.2uH,10%,9.8x4.2mm | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| L101R | 303.8 | 227.5 | 2701-001036 | INDUCTOR-AXIAL | 1.2uH,10%,9.8x4.2mm | |
| L401 | 92.5 | 220.5 | BH27-20003A | COIL-LINEARITY | 0.06OHM,0.15,DR-1415,IVORY,35M | 15" Philips |
| | | | BH27-20309T | COIL-LINEARITY | 0.06OHM,16.5*16.5*30 | 14" |
| | | | BH27-20334K | COIL-LINEARITY | 6.2UH | 15" SDD |
| L402 | 143 | 138.5 | BH27-20343L | COIL-CHOKE | 170UH,10%,DR14*20,BULK | |
| L403 | 44.3 | 119.5 | 2701-000154 | INDUCTOR-AXIAL | 220uH,10%,4.2x9.8mm | |
| L501 | 110.5 | 117.3 | BH27-20342V | COIL-CHOKE | 200UH,15%,DR14*20,BULK | |
| L502 | 66.3 | 210 | BH27-20342U | COIL-CHOKE | 7.1MH,10%,DR8*11,BULK | |
| L503 | 194.3 | 119.5 | 2701-000154 | INDUCTOR-AXIAL | 220uH,10%,4.2x9.8mm | |
| L601 | 279.8 | 55.8 | BH27-20022A | COIL-LINE FILTER | 0.3OHM,-,B,1UEW0.40,5T,3 | |
| L602 | 266 | 27 | BH26-30008A | TRANS-LINE FILTER | 15MH,8P,EE,SB-5S,15MH,EE-222 | ⚠ |
| OP201 | 14.3 | 31.8 | 0601-001147 | LED | ROUND,GRN,4.75mm,565nm | |
| OP601 | 199.5 | 17.5 | 0604-001018 | PHOTO-COUPLER | DAR-TR,63-125%,200mW,DIP-4,ST | ⚠ |
| Q101 | 244.5 | 172.8 | 0501-000412 | TR-SMALL SIGNAL | KSP42,NPN,625mW,TO-92,40 | |
| Q102 | 251.5 | 180.3 | 0501-000277 | TR-SMALL SIGNAL | KSA1013-Y,PNP,-900mW,TO-92L,TP | |
| Q201 | 16 | 12 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q202 | 70.5 | 120 | 0501-000122 | TR-NPN,2N3904,TO-92,EBC | 0.625W,60V,40V,6V,0.2A | |
| Q203 | 35.5 | 88.5 | 0501-000303 | TR-SMALL SIGNAL | KSA733-Y,PNP,250mW,TO-92,120 | |
| Q301 | 100.5 | 84.8 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q402 | 134.3 | 174.3 | 0502-001001 | TR-POWER | KSC5088,NPN,1500V,1500V,8A,50W | |
| Q403 | 68.5 | 198 | 0501-000369 | TR-NPN,KSC2331,TO-92L,ECB | | |
| Q404 | 23 | 229.5 | 0505-000011 | FET-N,IRF630,TO-220,GDS | 75W,200V,9A | |
| Q405 | 15 | 228.8 | 0505-001102 | FET-SILICON | IRFR/U230A,N,200V,7.5A,400mohm | |
| Q406 | 44.5 | 198.5 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q407 | 55.5 | 200.3 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q408 | 158.5 | 130 | 0501-000303 | TR-SMALL SIGNAL | KSA733-Y,PNP,250mW,TO-92,120 | |
| Q409 | 163 | 134.5 | 0501-000303 | TR-SMALL SIGNAL | KSA733-Y,PNP,250mW,TO-92,120 | |
| Q410 | 171.8 | 148.8 | 0503-000001 | TR-DARLINGTON | KSE800, NPN,60V,60V,4A,40W,TO-126 | |
| Q413 | 77 | 198 | 0501-000369 | TR-NPN,KSC2331,TO-92L,ECB | | |
| Q501 | 207.5 | 226.5 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q502 | 214 | 227.5 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q504 | 169.5 | 134.5 | 0501-000143 | TR-SMALL SIGNAL | 2N6520,PNP,625mW,TO-92,30-20 | |
| Q506 | 219 | 222 | 0501-000303 | TR-SMALL SIGNAL | KSA733-Y,PNP,250mW,TO-92,120 | |
| Q507 | 101.5 | 180 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q508 | 109.3 | 150 | 0505-000011 | FET-N,IRF630,TO-220,GDS | 75W,200V,9A | |
| Q509 | 101.5 | 174 | 0501-000303 | TR-SMALL SIGNAL | KSA733-Y,PNP,250mW,TO-92,120 | |
| Q510 | 201.5 | 132.5 | 0501-000492 | TR-SMALL SIGNAL | MPS3646,NPN,625mW,TO-92,30-1 | |
| Q601 | 277.5 | 115.5 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| Q602 | 36 | 199 | 0501-000122 | TR-NPN,2N3904,TO-92,EBC | 0.625W,60V,40V,6V,0.2A | |
| Q603 | 143.5 | 67.5 | 0502-000249 | TR-POWER | KSB772-Y,PNP,10W,TO-126,160- | |
| Q604 | 141.8 | 77.5 | 0501-000586 | TR-NPN,KSC945,TO-92,EBC | 0.25W,60V,50V,5V,0.15A | |
| R100 | 310.5 | 127.5 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R101B | 311.3 | 145.3 | 2001-000089 | REF-CF,150K,5%,1/6W | 150V,-1300 TO +350PPM/C,R- | |
| R101G | 311.3 | 150.8 | 2001-000090 | R-CARBON | 180Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R101R | 311.3 | 156.3 | 2001-000089 | REF-CF,150K,5%,1/6W | 150V,-1300 TO +350PPM/C,R- | |
| R102B | 260.5 | 136.5 | 2001-000665 | R-CARBON | 33ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R102G | 260.5 | 134 | 2001-000665 | R-CARBON | 33ohm,5%,1/6W,AA,TP,1.8x3.2mm | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| R102R | 260.5 | 131.5 | 2001-000665 | R-CARBON | 33ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R103B | 256.8 | 138.5 | 2001-000025 | R-CARBON | 75ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R103G | 254 | 138.5 | 2001-000025 | R-CARBON | 75ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R103R | 251.3 | 138.5 | 2001-000025 | R-CARBON | 75ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R104B | 279 | 230.5 | 2001-000021 | R-CARBON | 27ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R104G | 284 | 230.5 | 2001-000021 | R-CARBON | 27ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R104R | 289 | 230.5 | 2001-000021 | R-CARBON | 27ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R105B | 287 | 215 | 2001-000084 | R-CARBON | 100Kohm,5%,1/4W,AA,TP,2.4x6.4m | |
| R105G | 312 | 213 | 2001-000084 | R-CARBON | 100Kohm,5%,1/4W,AA,TP,2.4x6.4m | |
| R105R | 313.3 | 233.8 | 2001-000084 | R-CARBON | 100Kohm,5%,1/4W,AA,TP,2.4x6.4m | |
| R107B | 305 | 201 | 2001-000028 | R-CARBON(S) | 100ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R107G | 263.5 | 175.3 | 2001-000028 | R-CARBON(S) | 100ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R107R | 310 | 183 | 2001-000028 | R-CARBON(S) | 100ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R108B | 317.8 | 176.5 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R108G | 323 | 191.5 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R108R | 322.3 | 225.3 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R109B | 314.5 | 183 | 2001-000495 | R-CARBON | 20Kohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R109G | 323 | 207.5 | 2001-000495 | R-CARBON | 20Kohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R109R | 324.3 | 227.8 | 2001-000495 | R-CARBON | 20Kohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R110 | 271.5 | 219.5 | 2001-001070 | R-CARBON(S) | 120ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R111 | 270.3 | 150 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R112 | 252.3 | 225.3 | 2001-000835 | R-CARBON | 51Kohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R113 | 264.5 | 153 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R114 | 285 | 167.3 | 2001-000511 | R-CARBON | 220ohm,5%,1/2W,AA,TP,3.3x9mm | |
| R115 | 255.5 | 163.3 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R116 | 267 | 153 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R117 | 278 | 153 | 2001-000039 | R-CARBON | 390ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R118 | 272.5 | 153 | 2001-000039 | R-CARBON | 390ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R119 | 294 | 152 | 2001-000039 | R-CARBON | 390ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R120 | 254.8 | 194 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R121 | 252 | 176.8 | 2001-000090 | R-CARBON | 180Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R122 | 247 | 183.5 | 2001-000077 | R-CARBON | 47Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R201 | 69 | 33 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R202 | 66.5 | 33 | 2001-000077 | R-CARBON | 47Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R205 | 59 | 33 | 2001-000496 | R-CARBON | 20Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R206 | 56.5 | 33 | 2001-000496 | R-CARBON | 20Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R208 | 27.5 | 17 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R210 | 33 | 17 | 2001-000035 | REF-CF,220,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R212 | 62.5 | 86 | 2001-000562 | R-CARBON | 27Kohm,5%,1/6W,AA,TP,1.8x3.2mm | 15 |
| R213 | 37.5 | 67.3 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R214 | 32.5 | 67.3 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R215 | 26.5 | 36 | 2001-000108 | R-CARBON | 18Kohm,5%,1/6W,AA,TP,1.8x3.2mm | 15 |
| | | | 2001-000069 | R-CARBON | 12Kohm,5%,1/6W,AA,TP,1.8x3.2mm | 14" |
| R216 | 80 | 77.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R217 | 29 | 36 | 2001-000101 | R-CARBON | 11Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R218 | 31.5 | 35.9 | 2001-000367 | R-CARBON | 15Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R219 | 42.5 | 68 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| R220 | 48 | 39.5 | 2001-000097 | R-CARBON | 1M ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R221 | 51.5 | 33 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R222 | 54 | 33 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R223 | 65 | 68 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R224 | 67.5 | 68 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R225 | 25 | 27 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R226 | 51.3 | 96.8 | 2001-000040 | R-CARBON | 470ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R227 | 44.3 | 101.5 | 2001-000077 | R-CARBON | 47Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R228 | 46.8 | 101.5 | 2001-000077 | R-CARBON | 47Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R229 | 32.5 | 11 | 2001-000042 | R-CARBON | 1Kohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R230 | 60 | 109.5 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R231 | 54.3 | 17 | 2001-000053 | R-CARBON | 3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R232 | 56.8 | 17 | 2001-000053 | R-CARBON | 3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R233 | 65.8 | 27 | 2001-000029 | R-CARBON | 100ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R234 | 54 | 109.5 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R235 | 61.8 | 17 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R236 | 56.5 | 109.5 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R237 | 48.3 | 25 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R238 | 59.3 | 17 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R239 | 77.5 | 81 | 2001-001099 | REF-CF,2.7K,5%,1/2W(S | 300V,-200 TO +200PPM/C,R-AX | |
| R240 | 62.5 | 109.5 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R241 | 25 | 119.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R242 | 25 | 109.8 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R243 | 25 | 107.3 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R244 | 25 | 94.8 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R245 | 37 | 117 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R246 | 37 | 114.5 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R247 | 37 | 104.8 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R248 | 37 | 102.3 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R249 | 22.5 | 116 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R250 | 22.5 | 109.3 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R251 | 22.5 | 104.5 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R252 | 13 | 67 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R253 | 15 | 119 | 2001-000367 | R-CARBON | 15Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R254 | 13.5 | 136.5 | 2001-000367 | R-CARBON | 15Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R256 | 222.5 | 107 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R257 | 222.5 | 104.5 | 2001-000553 | R-CARBON | 270ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R258 | 222.5 | 102 | 2001-000553 | R-CARBON | 270ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R259 | 224 | 98.5 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R260 | 247.3 | 109.5 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R262 | 40 | 67.3 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R264 | 21.5 | 20.5 | 2001-000652 | R-CARBON | 330ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R266 | 40.8 | 115.5 | 2001-000053 | R-CARBON | 3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R267 | 30.5 | 27 | 2001-000072 | R-CARBON | 22Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R268 | 17.3 | 53 | 2001-000367 | R-CARBON | 15Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R269 | 18 | 74 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R270 | 45 | 68 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| R271 | 227.5 | 109.5 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R301 | 132 | 109.7 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R302 | 94 | 89.5 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R305 | 93.5 | 68 | 2001-000059 | REF-CF,5.6K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R306 | 93.5 | 70.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R307 | 133.5 | 17.5 | 2008-000003 | R-FUSIBLE | 0.22ohm, 5%, 1/2W, AT, TP, 3.5x9.4mm | |
| R308 | 149.5 | 11.8 | 2008-000003 | R-FUSIBLE | 0.22ohm, 5%, 1/2W, AT, TP, 3.5x9.4mm | |
| R309 | 125.5 | 35.5 | 2001-000245 | REF-CF,1.5,5%,1/2W | 350V,-350 TO +350PPM/C,R-AX | |
| R310 | 136.5 | 75.3 | 2003-000650 | R-METAL OXIDE(S) | 330ohm,5%,2W,AA,TP,4x12mm | |
| R311 | 121.5 | 55 | 2004-001022 | REF-MF,5.6K,1%,1/4W | 250V,-100 TO +100PPM/C,R-AX | |
| R312 | 121.5 | 80 | 2003-000412 | R-METAL OXIDE(S) | 0.9ohm,5%,2W,AA,TP,4x12mm | |
| R313 | 101.5 | 59.5 | 2001-000069 | R-CARBON | 12Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R314 | 101.5 | 45 | 2001-000104 | R-CARBON | 1.2Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R315 | 101.5 | 50.8 | 2001-000064 | R-CARBON | 7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R316 | 88 | 21 | 2001-000075 | R-CARBON | 39Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R317 | 85.5 | 39.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R318 | 104.5 | 28.5 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |
| R319 | 88 | 30.5 | 2001-000064 | R-CARBON | 7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R320 | 100.5 | 17 | 2003-000807 | R-METAL OXIDE(S) | 82ohm,5%,2W,AA,TP,4x12mm | |
| R321 | 85.5 | 28 | 2001-000083 | R-CARBON | 82Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R322 | 111.3 | 84.3 | 2001-000066 | R-CARBON(S) | 10Kohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R401 | 185.5 | 132.8 | 2001-000072 | R-CARBON | 22Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R403 | 28.5 | 144.5 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |
| R404 | 28.5 | 147 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |
| R405 | 72 | 143 | 2001-000097 | R-CARBON | 1M ohm,5%,1/6W,AA,TP,1.8x3.2mm | ⚠ |
| R406 | 47.8 | 128 | 2004-001136 | R-METAL | 6.8Kohm,1%,1/4W,AA,TP,2.4x6.4m | |
| R407 | 81 | 137.5 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R408 | 55.8 | 134.3 | 2001-000048 | REF-CF,2.2K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R409 | 44.5 | 163 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |
| R410 | 78.5 | 178.8 | 2003-000587 | R-METAL OXIDE(S) | 22ohm,5%,1W,AA,TP,3.3x9mm | |
| R412 | 69.5 | 221.3 | 2001-000020 | REF-CF,22,5%,1/2W(S | 300V,-200 TO +200PPM/C,R-AX | |
| R414 | 111.3 | 220.5 | 2001-000016 | R-CARBON(S) | 1ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R415 | 135.5 | 218 | 2001-000525 | R-CARBON | 22ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R416 | 75.5 | 215 | 2003-000009 | R-METAL OXIDE(S) | 220ohm,5%,1W,AA,TP,3.3x9mm | |
| R417 | 68 | 178.8 | 2001-001107 | REF-CF,220,5%,1/2W(S | 300V,-200 TO +200PPM/C,R-AX | |
| R418 | 58.5 | 183.5 | 2001-000404 | R-CARBON | 180ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R419 | 63.5 | 198.5 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |
| R420 | 29.8 | 192 | 2001-000048 | REF-CF,2.2K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R421 | 27 | 192 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R422 | 19.5 | 217.1 | 2001-000097 | R-CARBON | 1M ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R423 | 9.5 | 217 | 2001-000097 | R-CARBON | 1M ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R424 | 51 | 179.3 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R425 | 53.5 | 179.3 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R427 | 23 | 216.9 | 2001-000076 | REF-CF,47K,5%,1/4W | 250V,-600 TO -150PPM/C,R-AX | |
| R428 | 12.5 | 217 | 2001-000076 | REF-CF,47K,5%,1/4W | 250V,-600 TO -150PPM/C,R-AX | |
| R430 | 163 | 114 | 2001-000721 | R-CARBON | 4.3Kohm,5%,1/4W,AA,TP,2.4x6.4m | |
| R431 | 168 | 151.5 | 2001-000089 | REF-CF,150K,5%,1/6W | 150V,-1300 TO +350PPM/C,R- | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| R432 | 80.5 | 119.3 | 2001-000090 | R-CARBON | 180Kohm,5%,1/6W,AA,TP,1.8x3.2m | 15" |
| | | | 2001-000086 | R-CARBON | 100Kohm,5%,1/6W,AA,TP,1.8x3.2m | 14" |
| R434 | 166.5 | 102.8 | 2001-000538 | R-CARBON | 24Kohm,5%,1/6W,AA,TP,1.8x3.2mm | 15" |
| | | | 2001-000562 | R-CARBON | 27Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R435 | 163 | 143.5 | 2001-000053 | R-CARBON | 3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R436 | 165.5 | 143.5 | 2001-000836 | R-CARBON | 51Kohm,5%,1/6W,AA,TP,1.8x3.2mm | 15" |
| R437 | 55.5 | 161 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R438 | 74 | 115 | 2001-000088 | R-CARBON | 120Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R439 | 18.8 | 88 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R440 | 18.8 | 90.5 | 2001-000868 | R-CARBON | 56ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R441 | 47.5 | 115 | 2001-000367 | R-CARBON | 15Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R442 | 78 | 143 | 2001-000531 | R-CARBON | 240Kohm,5%,1/8W,AA,TP,1.8x3.2m | |
| R443 | 75 | 154.8 | 2001-000547 | R-CARBON | 270Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R444 | 216.5 | 189.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R445 | 98.3 | 126.5 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R447 | 75.1 | 193.8 | 2003-000276 | R-METAL OXIDE | 33ohm,5%,1W,AA,TP,4.3x12mm | |
| R448 | 131.5 | 197 | 2001-000246 | R-CARBON | 1.5ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R502 | 92.5 | 165.5 | 2001-000069 | R-CARBON | 12Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R503 | 81.5 | 160 | 2001-000079 | R-CARBON | 56Kohm,5%,1/6W,AA,TP,1.8x3.2mm | ⚠ |
| R504 | 198.5 | 231.5 | 2001-000562 | R-CARBON | 27Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R505 | 210.5 | 226.5 | 2001-000104 | R-CARBON | 1.2Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R506 | 95 | 153.3 | 2004-000216 | R-METAL | 10Kohm,1%,1/4W,AA,TP,2.4x6.4mm | ⚠ |
| R507 | 81 | 140 | 2001-000075 | R-CARBON | 39Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R508 | 95 | 162.5 | 2004-000284 | R-METAL | 12Kohm,1%,1/4W,AA,TP,2.4x6.4mm | ⚠ |
| R509 | 82.5 | 177.5 | 2004-004095 | R-METAL | 2.36Kohm,1%,1/4W,AA,TP,2.4x6.4 | ⚠ |
| R510 | 184.5 | 230 | 2001-000836 | R-CARBON | 51Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R511 | 219 | 209 | 2001-000057 | REF-CF,5.1K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R512 | 180.3 | 144 | 2001-000547 | R-CARBON | 270Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R513 | 227.3 | 167.3 | 2008-000106 | REF-FUSIBLE,0.56,5%,1/2W | -350 TO +350PPM/C,R-AXIAL | |
| R515 | 158 | 114 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R516 | 224 | 189.5 | 2001-000688 | R-CARBON | 390Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R518 | 212.5 | 211.5 | 2001-000090 | R-CARBON | 180Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R520 | 180.3 | 141.5 | 2001-000115 | R-CARBON | 82Kohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| | | | 2001-000078 | R-CARBON | 56Kohm,5%,1/4W,AA,TP,2.4x6.4mm | 14" ORION |
| R521 | 207.5 | 156.5 | 2001-000107 | R-CARBON(S) | 150Kohm,5%,1/2W,AA,TP,2.4x6.4m | |
| R522 | 206.5 | 159 | 2001-000096 | R-CARBON(S) | 1M ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R523 | 216 | 218 | 2001-000688 | R-CARBON | 390Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R524 | 213.3 | 215.5 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R525 | 212.8 | 135.3 | 2001-000100 | R-CARBON | 2.2M ohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R527 | 105 | 182.3 | 2001-001099 | REF-CF,2.7K,5%,1/2W(S | 300V,-200 TO +200PPM/C,R-AX | |
| R528 | 124 | 167.8 | 2003-000007 | REF-MO,82,5%,3W(S | 350V,-350 TO +350PPM/C,R-AX | |
| R529 | 108 | 182.3 | 2001-000110 | REF-CF,10,5%,1/4W | 250V,-350 TO +350PPM/C,R-AX | |
| R530 | 102.5 | 129 | 2005-000401 | R-WIRE WOUND | 0.47ohm,5%,2W,AA,TP,4x12mm | |
| R531 | 122.5 | 147.5 | 2003-000386 | REF-MO,910,5%,2W | 350V,-200 TO +200PPM/C,R-AX | |
| R532 | 221.5 | 189.5 | 2001-000091 | R-CARBON | 220Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R534 | 74 | 157.3 | 2001-000097 | R-CARBON | 1M ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R536 | 190 | 130 | 2001-000048 | REF-CF,2.2K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| R537 | 190 | 127.5 | 2001-000053 | R-CARBON | 3.3Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R538 | 196 | 137.5 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R539 | 201.3 | 122.5 | 2001-000069 | R-CARBON | 12Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R540 | 190 | 132.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R542 | 219.8 | 143.5 | 2001-000064 | R-CARBON | 7.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R543 | 178.5 | 138.5 | 2001-000074 | R-CARBON | 33Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R544 | 169.5 | 115.8 | 2001-003105 | R-CARBON | 1ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R545 | 170 | 122.8 | 2001-003105 | R-CARBON | 1ohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R546 | 181 | 226.5 | 2001-000067 | REF-CF,10K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R602 | 286 | 114.5 | 2001-000027 | R-CARBON | 100ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R603 | 267.3 | 114.5 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R604 | 184.5 | 18.8 | 2001-000111 | R-CARBON | 150ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R605 | 172 | 9 | 2004-001060 | R-METAL | 51Kohm,1%,1/4W,AA,TP,2.4x6.4mm | ⚠ |
| R606 | 195.5 | 12.5 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R607 | 175 | 9 | 2001-000889 | REF-CF,6.8K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | ⚠ |
| R609 | 178 | 9 | 2004-004095 | R-METAL | 2.36Kohm,1%,1/4W,AA,TP,2.4x6.4 | ⚠ |
| R611 | 174.5 | 87 | 2003-000006 | R-METAL OXIDE | 47ohm,5%,1W,AA,TP,4.3x12mm | |
| R612 | 250.5 | 10 | 2003-000741 | REF-MO,56K,5%,3W(S | 500V,-200 TO +200PPM/C,RE-R | |
| R613 | 164 | 56 | 2001-000432 | R-CARBON | 1Mohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R614 | 284.8 | 14 | 2001-000642 | REF-CF,330K,5%,1/2W | 350V,-600 TO -150PPM/C,R-AX | |
| R615 | 247.5 | 53.5 | 2001-000374 | R-CARBON | 15ohm,5%,1/4W,AA,TP,2.4x6.4mm | |
| R616 | 266 | 68.3 | 2003-000771 | REF-MO,68K,5%,2W(S | 500V,-200 TO +200PPM/C,R-AX | |
| R617 | 34.5 | 175 | 2001-000987 | REF-CF,820K,5%,1/4W | 250V,-1000 TO -500PPM/C,R-A | |
| R618 | 258.5 | 40.5 | 2003-000010 | REF-MO,8.2K,5%,3W(S | 350V,-350 TO +350PPM/C,R-AX | |
| R619 | 39 | 187 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R620 | 204 | 92 | 2003-000432 | R-METAL OXIDE(S) | 1.5Kohm,5%,3W,AA,TP,6x16mm | |
| R621 | 150 | 78 | 2001-000056 | REF-CF,4.7K,5%,1/6W | 150V,-1300 TO +350PPM/C,R-A | |
| R622 | 163 | 52.8 | 2003-000631 | R-METAL OXIDE(S) | 3.3ohm,5%,3W,AA,TP,6x16mm | 15" |
| | | | 2003-000005 | R-METAL OXIDE(S) | 1ohm,5%,2W,AA,TP,4x12mm | 14" |
| R623 | 222 | 76.5 | 2001-001163 | R-CARBON(S) | 560ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| R624 | 144 | 71.5 | 2001-000077 | R-CARBON | 47Kohm,5%,1/6W,AA,TP,1.8x3.2mm | |
| R625 | 151 | 74 | 2001-000043 | REF-CF,1K,5%,1/6W | 150V,-1300 TO +350PPM,R-AXI | |
| R626 | 195.5 | 15 | 2001-000106 | R-CARBON | 1.5Kohm,5%,1/6W,AA,TP,1.8x3.2m | |
| R628 | 181.5 | 39.5 | 2001-000019 | R-CARBON(S) | 10ohm,5%,1/2W,AA,TP,2.4x6.4mm | |
| RL601 | 286.3 | 85 | 3501-000266 | RELAY-POWER | 12V,720m/W,5A,2FormA,3mS | |
| RL602 | 290 | 106 | 3501-000136 | RELAY-MINIATURE | 12V,360mW,5A,1FormA,10mS,10mS | |
| SK101 | 305.3 | 159 | 4715-000001 | SURGE ABSORBER | 1KV,+50-10% | |
| SK102 | 281.5 | 171.3 | 4715-000106 | SURGE ABSORBER | 300V,CHIP | |
| SK103 | 295 | 178.5 | 3704-001015 | SOCKET-CRT | 8P,15.24PI,25.6PI,SN | |
| SW201 | 7 | 189.5 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW202 | 7 | 175.5 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW203 | 7 | 161.5 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW204 | 7 | 20 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW205 | 7 | 104.4 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW206 | 7 | 90.4 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW207 | 7 | 76.4 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW208 | 7 | 62.4 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |

| Loc. No. | Coordinates (X,Y) | | New Code No. | Description | Specification | Remarks |
|---|---|---|---|---|---|---|
| SW209 | 7 | 120.2 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW210 | 7 | 131.7 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW211 | 7 | 147.5 | 3404-000244 | SWITCH-TACT,7.3X7.1X4 | 12V,50MA,SPST,160G,MECH | |
| SW401 | 86.5 | 237 | 3406-000002 | SWITCH-TOGGLE,SP3T | ON-ON-ON,STRAIGHT | |
| T401 | 95 | 187.5 | BH26-30336A | TRANS-HOR.DRIVE | 9.6MH,6P,EE2017,SB-5S,9.6MH/10 | ⚠ |
| T501 | 188 | 181 | BH26-10335A | TRANS-FBT | 1.22mH,12P,FKD-15A001 | |
| T601 | 217.5 | 26.5 | BH26-20335T | TRANS-POWER | 430uH,16P,EER3541,PL-3/PM-2,7. | ⚠ |
| T602 | 214.5 | 79 | BH26-30302S | TRANS-SYNC,250UH | C/MONITOR,CVL 4951 | ⚠ |
| TCO | 172 | 242 | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | |
| TH601 | 263.5 | 95.5 | 1404-000002 | THERMISTOR-NTC | NTC,9OHM,20% | |
| TH602 | 272.5 | 77 | 1404-001020 | THERMISTOR-NTC | 8ohm,15%,17mW/C,BK | |
| TILT | 175.3 | 242 | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | |
| VR101B | 322.8 | 141 | 2103-000007 | vr3 | 1/10W | |
| VR101G | 322.8 | 149.5 | 2103-000007 | vr3 | 1/10W | |
| VR101R | 322.8 | 158 | 2103-000007 | vr3 | 1/10W | |
| VR102B | 322.8 | 182.5 | 2103-000291 | vr3 | 1/10W | |
| VR102G | 322.8 | 201.5 | 2103-000291 | vr3 | 1/10W | |
| VR102R | 322.8 | 221.5 | 2103-000291 | vr3 | 1/10W | |
| VR401 | 228.3 | 236.8 | 2103-000005 | vr3 | 1/10W | |
| VR501 | 193 | 237 | 2103-000005 | vr3 | 1/10W | |
| X201 | 47.5 | 43.5 | 2801-003033 | CRYSTAL-UNIT | 4MHz,30ppm,28-AAM,20pF,100ohm | |

## 10-1-4 USB OPTION

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| C622 | 2401-000038 | C-AL | 470UF,20%,25V,GP,TP,10X12.5 | |
| CN604 | 3722-001100 | JACK-DIN | 4P/2C,6MM,AG,BLK | |
| D612 | 0402-000005 | DIODE-RECTIFIER | 31DF4,400V,3A,DO-201AD | |

## 10-1-5 TCO OPTION

| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| CN606 | 3711-000178 | CONNECTOR-HEADER | 1WALL,2P,1R,3.96mm,STRAIGHT,SN | |
| JP203 | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | |
| RL601 | 3501-000266 | RELAY-POWER | 12V,720mV,5A,2formA,8mS,3mS | |

## 10-1-6 TILT OPTION

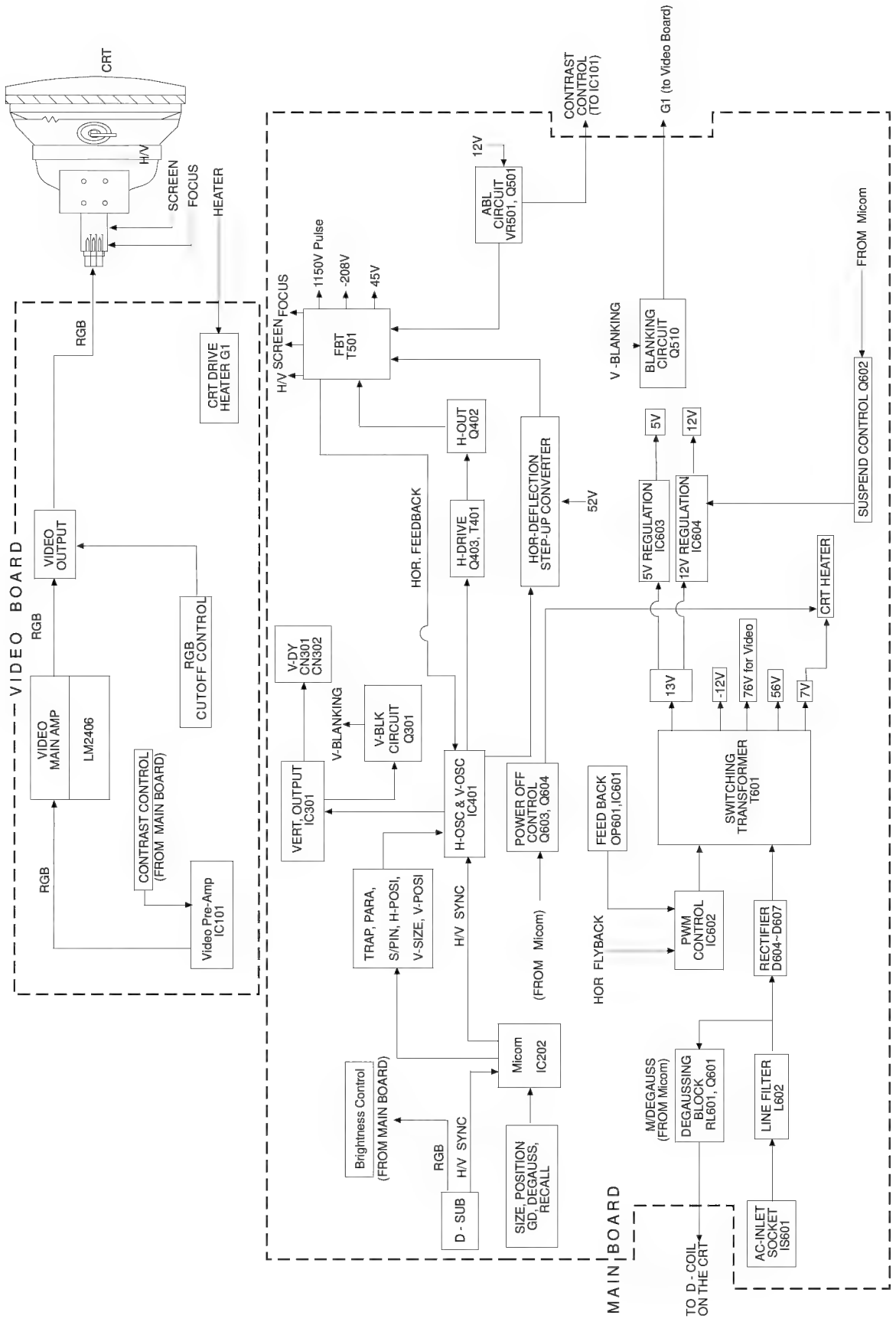
| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| C212 | 2401-000023 | C-AL,ELEC,50V,1UF | 1UF,20%,50V,GP,TP,5X11,5MM | |
| C312 | 2305-000001 | C-FRLM,MPEF | 470NF,10%,63V,TP,6.0X15.5X7.5MM | |
| CN303 | 3711-000024 | CONNECTOR-HEADER | BOX,3P,1R,2.5MM,STRAIGHT | |
| IC302 | 1201-001034 | IC-AMPLIFIER | 272,DIP,8P,150MIL,DUAL,PLAST | |
| JP207 | BH39-40305U | JUMPER-WIRE | JUMPER-WIRE | |
| R216 | 2001-000067 | R-CF,10K,5%,1/6W | 10KOHM,5%,1/6W,AA,TP,1.8X3.2MM | |
| R316 | 2001-000075 | R-CF,39K,5%,1/6W | 39KOHM,5%,1/6W,AA,TP,1.8X3.2MM | |
| R317 | 2001-000067 | R-CF,10K,5%,1/6W | 10KOHM,5%,1/6W,AA,TP,1.8X3.2MM | |
| R318 | 2001-000043 | R-CF,1K,5%,1/6W | 1KOHM,5%,1/6W,AA,TP,1.8X3.2MM | |
| R319 | 2001-000064 | R-CF,7.5K,5%,1/6W | 7.5KOHM,5%,1/6W,AA,TP,1.8X3.2MM | |
| R320 | 2003-000807 | R-MO,82,5%,2W | 5.6KOHM,2%,1/8W,AD,TP,1.8X3.2MM | |
| R321 | 2001-000083 | R-CF,82K,5%,1/6W | 82KOHM,5%,1/6W,AA,TP,1.8X3.2MM | |

## Others

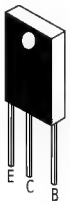
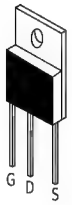
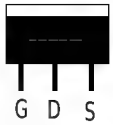
| Loc. No. | Code No. | Description | Specification | Remarks |
|---|---|---|---|---|
| CRT | BH03-10337E | CRT-COLOR,M PR II,14" | M 34KZM 16XX61(A) | ORION |
| | BH03-10338J | CRT-COLOR,M PR II,14" | M 34QBH351X122 | SDD (N.H.) |
| | BH03-10338P | CRT-COLOR,M PR II,14" | M 34QBH351X122(M ) | SDD (E.) |
| | BH03-10338Q | CRT-COLOR,M PR II,14" | M 34QBH351X122(R) | SDD (S.H.) |
| | BH03-10337F | CRT-COLOR,M PR II,14" | M 34AFA83X46 | CPT |
| | BH03-10337Z | CRT-COLOR,M PR II,15" | M 36QAW 351X105(E/LP) | SDD (N.H.) |
| | BH03-10338W | CRT-COLOR,M PR II,15" | M 36QAW 351X105(M /E/LP) | SDD (E.) |
| | BH03-10337X | CRT-COLOR,M PR II,15" | M 36QAW 351X105(R/E/LP) | SDD (S.H.) |
| | BH03-10335X | CRT-COLOR,M PR II,15" | M 36EDR320X151 | Philips |
| | BH03-10335X | CRT-COLOR,TCO,15" | M 36EDR320X151 | Philips |
| | BH03-10338K | CRT-COLOR,TCO,15" | M 36QAW 351X105(T4/LP) | SDD |
| CRT GND | BH39-40362A | CBF-CRT GROUND | 2P,410M M ,BLK,UL1015,AW G18,171 | 14" |
| | BH39-40361Z | CBF-CRT GROUND | 2P,800M M ,GRAY,UL1571,AW G28,S | 15" |
| D-COIL | BH27-10335T | DEGAUSSING COIL | 290*200*980,10.2M H | 14" |
| | BH27-10335S | DEGAUSSING COIL | 255*255*980,11.0M H | 15" |
| | BH27-10375R | DEGAUSSING COIL | 255*255*980,11.0M H | 15" TILT |
| M AGNET RUBBER | 3302-000006 | M AG-RUBBER M AGNET | AF,14G,1620-1980G,0.58-0.9 M GOE | |
| P/CORD | BH39-10007A | CBF-POW ER/CORD | DET,H05VV-F,250V/6A,1830M M | |
| | BH39-10339E | CBF-POW ER/CORD | DET,SVT,125V,7A/10A,IVORY,1830M M | |
| SIGNAL CABLE | BH39-20336S | CBF-SIGNAL | ATT,1200M M ,15P,IVORY,UL2969 | 14" |
| | BH39-20336T | CBF-SIGNAL | ATT, 1500M M ,15P,IVORY,UL2969 | 15" |

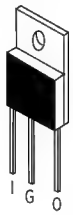
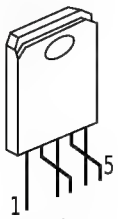
* N.H. : Northern Hemisphere
S.H. : Southern Hemisphere
E. : Equator

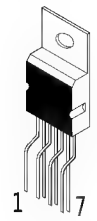
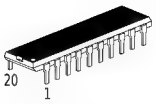
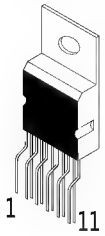
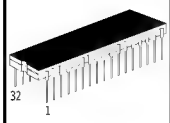
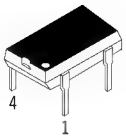
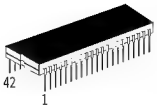
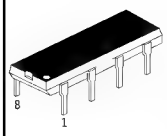
# 8 Block Diagram



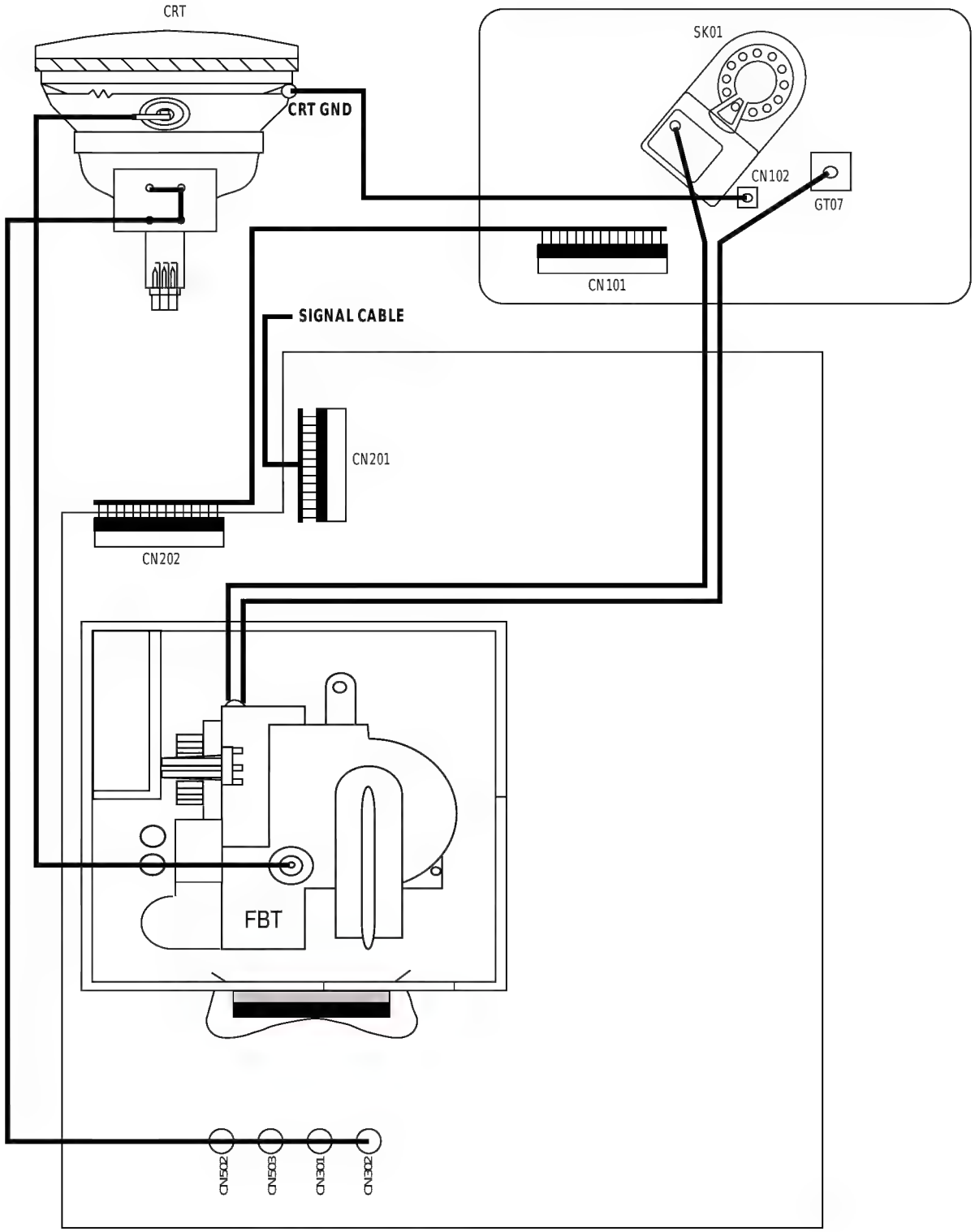
## 10-2 Semiconductor Lead Identification

| PARTS | TYPE NO. | REF. NO. |
|---|---|---|
| | FMP-G2FS | D403 |
| | KSC945 | Q201, Q301, Q406, Q407, Q501, Q502, Q507, Q601, Q604 |
| | KSA733 | Q203, Q408, Q409, Q505, Q506, Q509 |
| | 2N3904 | Q202, Q602 |
| | KSP42 | Q101 |
| | 2N6520 | Q504 |
| | MPS3646 | Q510 |
| | KSC2331 | Q403, Q413 |
| | KSA1013 | Q102 |
|  | KSB772 | Q603 |
| | KSE800 | Q410 |
|  | IRF630 | Q404, Q508 |
|  | IRFR/U230A | Q405 |

| PARTS | TYPE NO. | REF. NO. |
|---|---|---|
| | KSC5088 | Q402 |
| | KA431 | IC601 |
| | KA7545 | IC201 |
|  | MC7805 | IC603 |
| 1 : Vin,<br>2 : Vout,<br>3 : GND,<br>4 : Vcc | KA78R12 | IC604 |
|  1 : Drain,<br>2 : GND,<br>3 : Vcc,<br>4 : F/B,<br>5 : Sync | KA2H0880 | IC602 |

| PARTS | TYPE NO. | REF. NO. | PARTS | TYPE NO. | REF. NO. |
|---|---|---|---|---|---|
|  | TDA9302H | IC301 |  | KA2141 | IC101 |
|  | LM 2406 | IC102 |  | TDA9109 | IC401 |
|  | LTV817M-SM | QP601 |  | M C68HC705 | IC202 |
|  | 24LC04<br>24LC21<br>L272M | IC203<br>IC204<br>IC302 | | | |

# 9 Wiring Diagram



# 11 Schematic Diagrams

## 11-1 Cautions

1. The areas marked with a ⚠, ⚡ or ☢ on the schematic diagram designate components which have special characteristics important for safety.
   Replace these parts only with parts identical to those in the original circuit and those specified in the parts list.
   Before replacing any of these components, carefully read the "Product Safety Notice."
2. Areas marked with a ☢ on the schematic diagram designate controls which have been sealed for safety during manufacturing.
   If these controls need adjustment, they must be replaced with new controls and then sealed after their adjustment.
3. When taking measurements, pay special attention to the following:

   1) Do not use your instrument between primary ground (symbol ⏚) and secondary circuit.

   2) Do not use your instrument between secondary ground (symbol ⏚) and primary circuit.

## 11-2 Notes

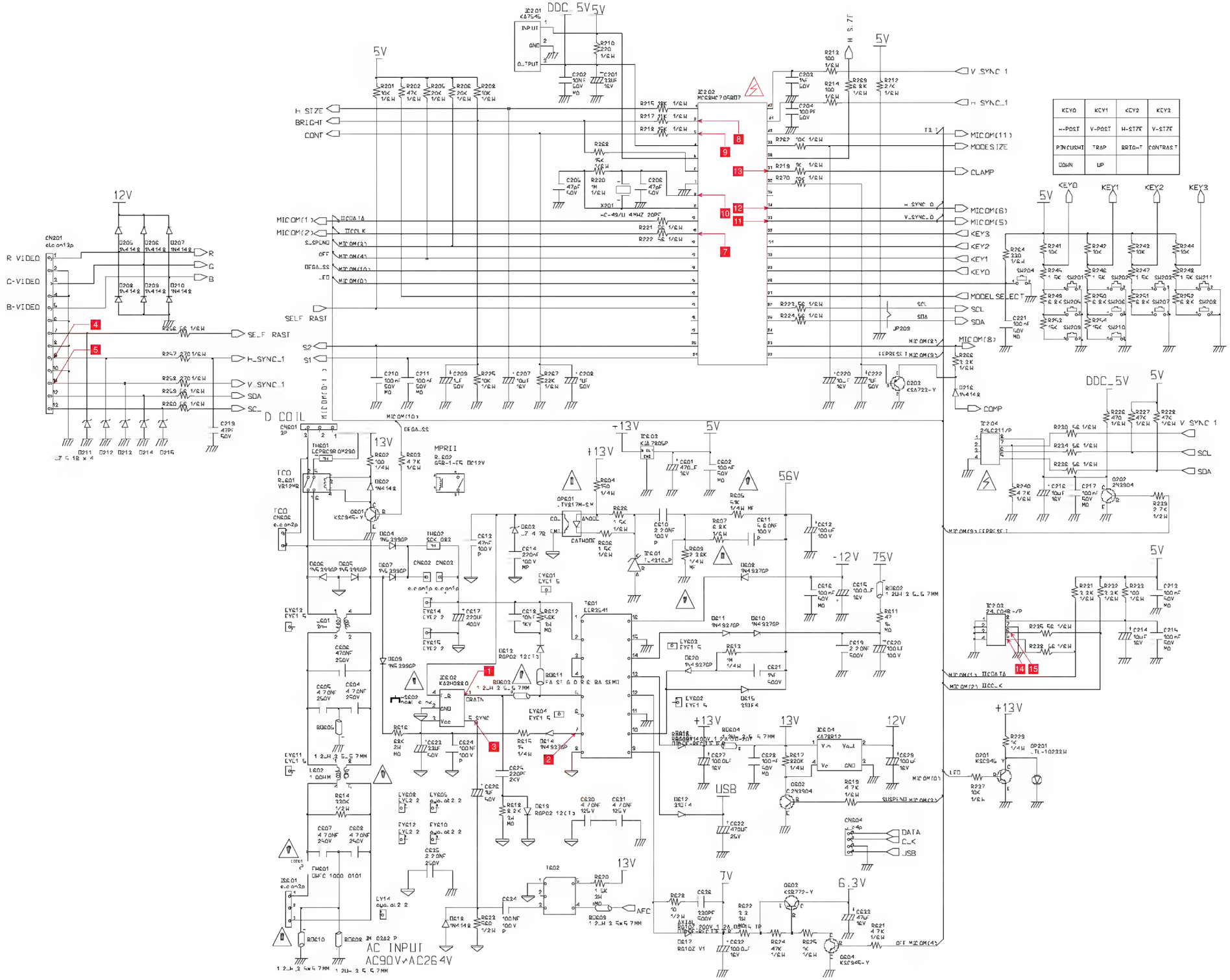
1. Resistance is shown in OHM. K = 1,000, M = 1,000,000 and the rated power of resistors not noted in the schematic diagram is 1/4W.
2. Capacitance is shown in μF. Capacitances not otherwise noted are shown in pF (1μF = 1,000,000 pF). Rated voltage of condensers not otherwise noted in the schematic diagram is 50 V.

## 11-3 Abbreviations and Symbols

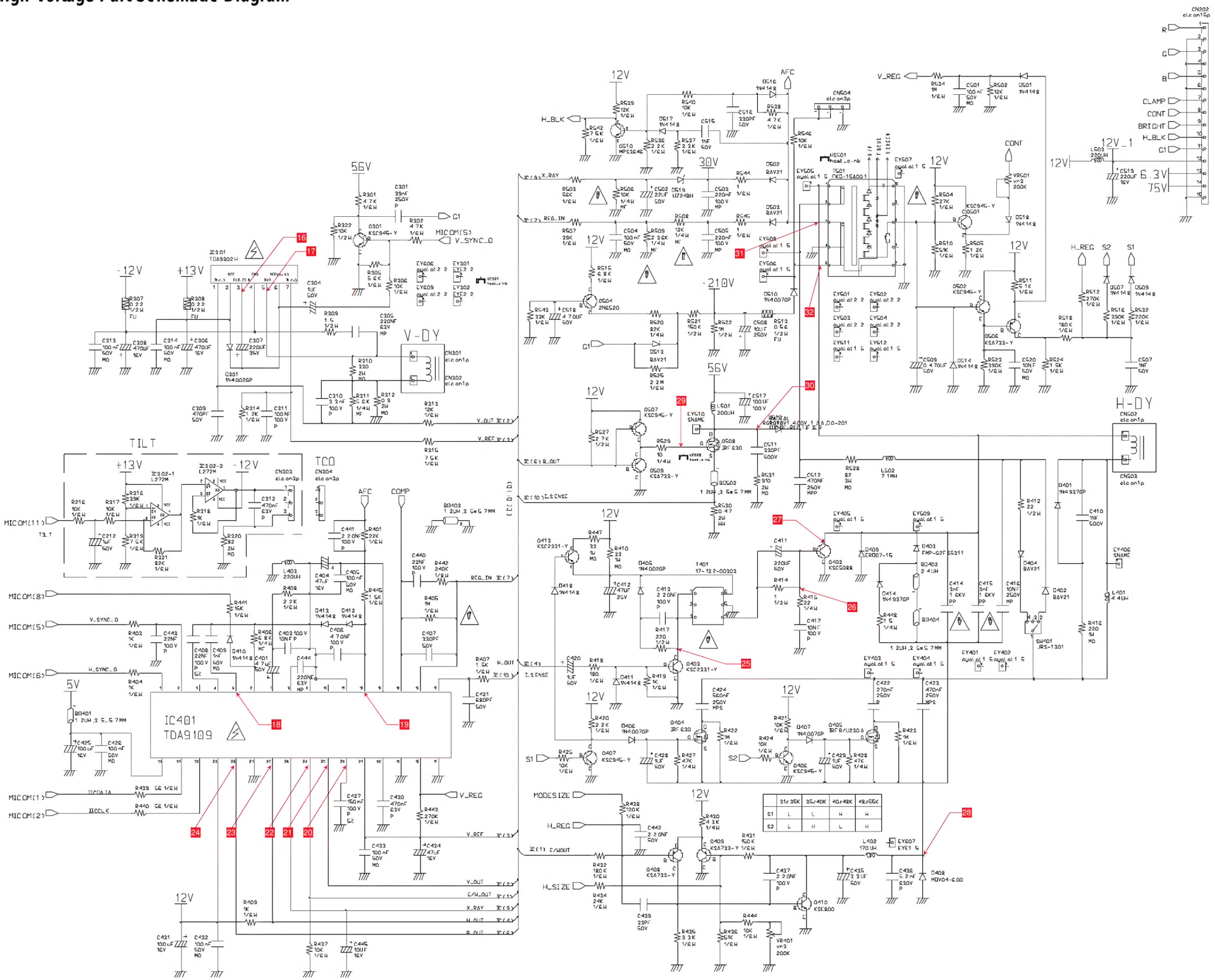
| | | | |
|---|---|---|---|
| MO | R-Metal Oxide | WW | R-Wire Wound |
| FU | Fusible | C | R-Composition |
| CM | R-Cement | MPP | Metal Polypropylene |
| MP | C-Metalized Polyester | T | C-Tantalum |
| P | C-Polyester | ☢ | Can emit X-radiation |
| ⏚ | Hot Ground | ⏚ | Cold Ground |
| ⚡ | Electrostatically Sensitive Device (ESD) | ⚠ | Provides special safety considerations |

1. The secondary voltage is read with an SSVM from the indicated point to a cold ground ( ⏚ ).
   The primary voltage is read with an SSVM from the indicated point to a hot ground ( ⏚ ).
2. This schematic diagram is subject to change without notice.

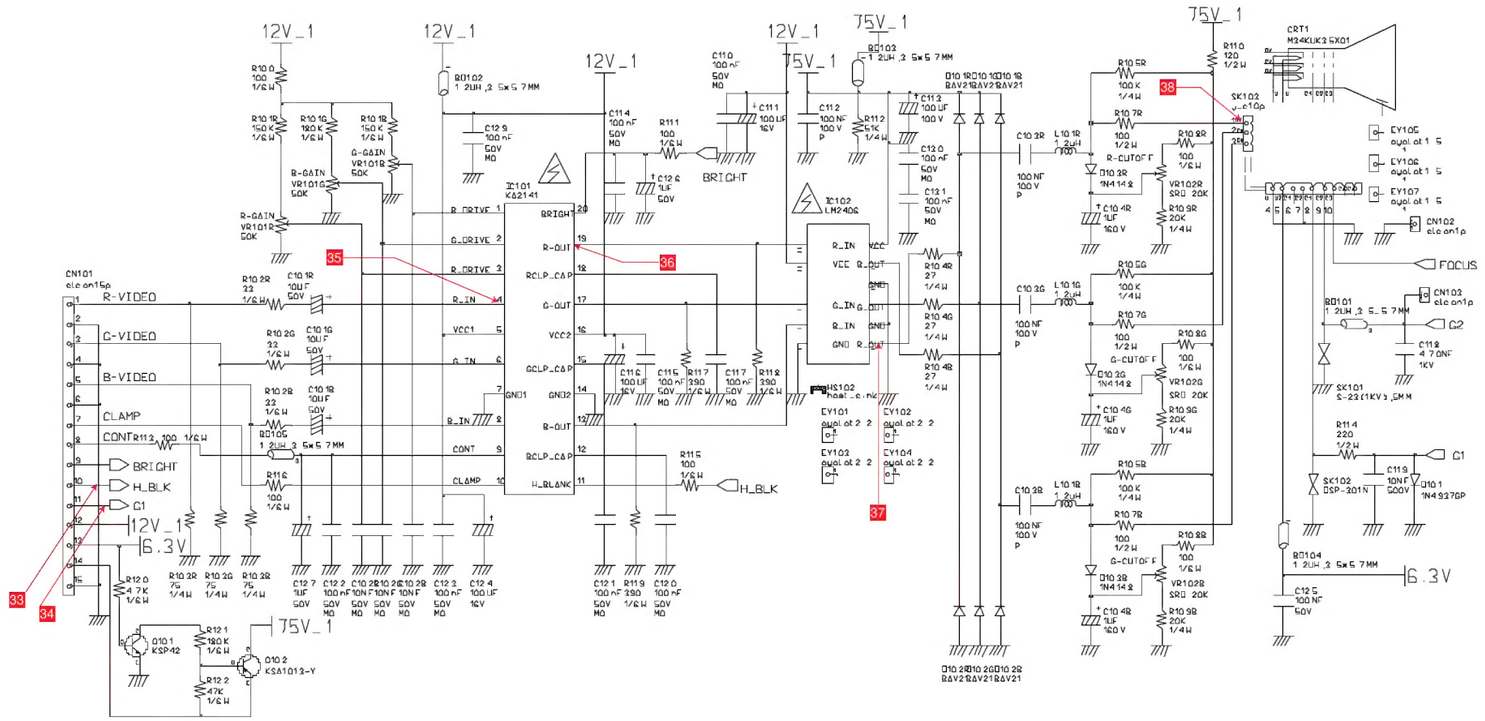
## 11-4 Micom/SMPS Part Schematic Diagram



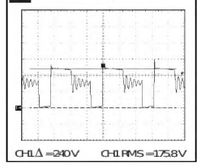
## 11-5 HV-Defl/High-Voltage Part Schematic Diagram



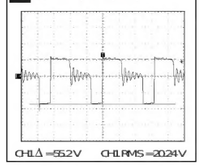
## 11-6 Video Part Schematic Diagram



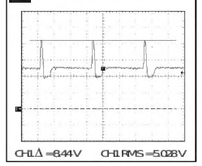
**1** 240 V (IC602, Drain)



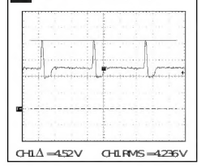

**2** 55.2 V (T601, #7)




**3** 8.44 V (IC602, #5)

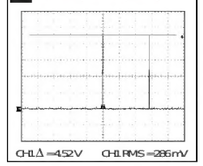



**4** 4.52 V (CN201, #9)



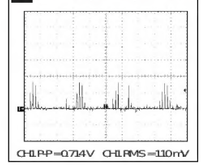

H-Sync

**5** 4.52 V (CN201, #11)

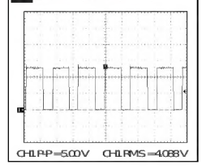



V-Sync

**6** 0.714 V (CN201, R-Video)

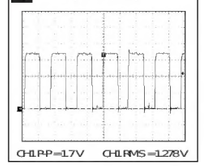



**7** 5.00 V (IC202, #11)

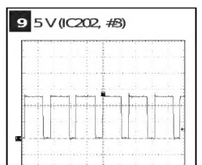



H-Size, duty

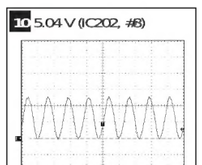
**8** 1.7 V (IC202, #2)



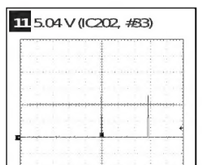

**9** 5 V (IC202, #3)



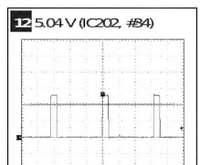

**10** 5.04 V (IC202, #8)



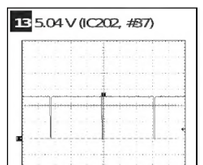

**11** 5.04 V (IC202, #83)



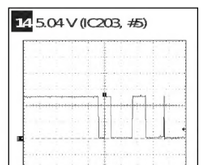

**12** 5.04 V (IC202, #84)



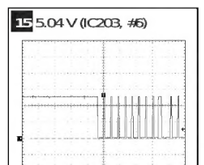

**13** 5.04 V (IC202, #87)



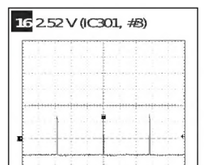

**14** 5.04 V (IC203, #5)



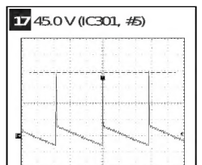

**15** 5.04 V (IC203, #6)



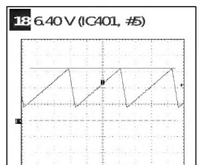

**16** 2.52 V (IC301, #8)



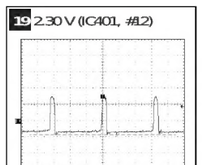

**17** 45.0 V (IC301, #5)



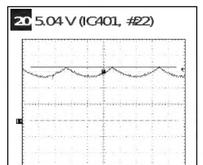

**18** 6.40 V (IC401, #5)



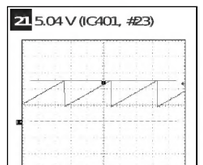

**19** 2.30 V (IC401, #12)



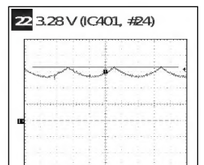

**20** 5.04 V (IC401, #22)



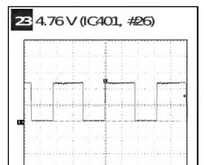

**21** 5.04 V (IC401, #23)



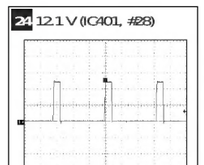

**22** 3.28 V (IC401, #24)




**23** 4.76 V (IC401, #26)

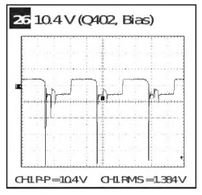



**24** 12.1 V (IC401, #28)



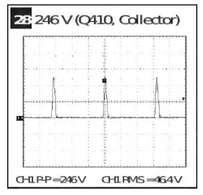

**25** 29.4 V (Q403, Collector)

**26** 10.4 V (Q402, Bias)

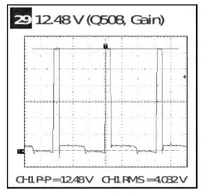



**27** 1.104 kV (Q402, Collector)

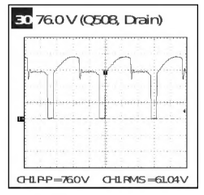
**28** 246 V (Q410, Collector)



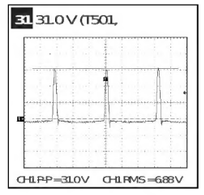

**29** 12.48 V (Q508, Gain)



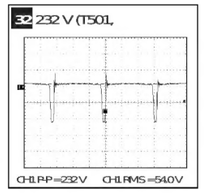

**30** 76.0 V (Q508, Drain)



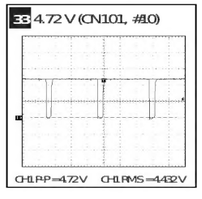

**31** 31.0 V (T501,



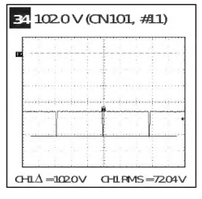

**32** 232 V (T501,



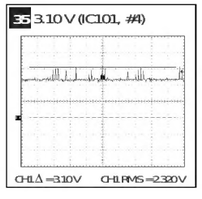

**33** 4.72 V (CN101, #10)



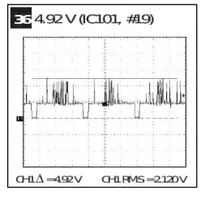

**34** 102.0 V (CN101, #11)



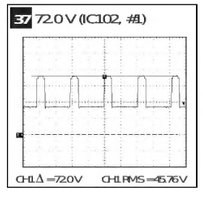

**35** 3.10 V (IC101, #4)




**36** 4.92 V (IC101, #19)




**37** 72.0 V (IC102, #1)




**38** 60.8 V (SK103, #1)

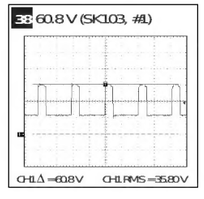


**Table 11-1. IC101 (KA2141)**

| pin # | MODES | | pin # | MODES | |
|---|---|---|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz | | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 1.47 | 1.47 | 11 | 4.37 | 4.13 |
| 2 | 1.74 | 1.74 | 12 | 5.79 | 5.8 |
| 3 | 1.84 | 1.84 | 13 | 3.42 | 3.35 |
| 4 | 2.39 | 2.39 | 14 | GND | GND |
| 5 | 11.65 | 11.66 | 15 | 5.52 | 5.53 |
| 6 | 2.38 | 2.38 | 16 | 11.65 | 11.66 |
| 7 | GND | GND | 17 | 3.53 | 3.46 |
| 8 | 2.39 | 2.39 | 18 | 5.49 | 5.50 |
| 9 | 0.16 ~ 3.04 | 0.16~3.04 | 19 | 3.59 | 3.52 |
| 10 | 4.99 | 4.93 | 20 | 1.5 ~ 2.1 | 1.5 ~ 2.1 |

**Unit: Vrms**

**Table 11-2. IC102 (LM2406)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 44.72 | 46V |
| 2 | GND | GND |
| 3 | 43.83 | 45.09 |
| 4 | GND | GND |
| 5 | 44.60 | 46 |
| 6 | 75.66 | 72.77 |
| 7 | GND | GND |
| 8 | 3.42 | 3.35 |
| 9 | 3.53 | 3.47 |
| 10 | 11.66 | 11.66 |
| 11 | 3.59 | 3.52 |

**Unit: Vrms**

**Table 11-3. IC201 (KIA7545)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 5.05 | 5.05 |
| 2 | GND | GND |
| 3 | 5.03 | 5.03 |

**Unit: Vrms**

**Table 11-4. IC202 (68HC705)**

| pin # | MODES | | pin # | MODES | |
|---|---|---|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz | | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 0~5 | 0~5 | 21 | – | – |
| 2 | 0~5 | 0~5 | 22 | – | – |
| 3 | 0~5 | 0~5 | 23 | 5.05 | 5.05 |
| 4 | 5.03 | 5.03 | 24 | 5.05 | 5.05 |
| 5 | 5.05 | 5.05 | 25 | 3.82 | 3.82 |
| 6 | – | – | 26 | 3.68 | 3.68 |
| 7 | GND | GND | 27 | – | – |
| 8 | 2.46 | 2.46 | 28 | 5.05 | 5.05 |
| 9 | 2.08 | 2.08 | 29 | 5.03 | 5.03 |
| 10 | 5.03 | 5.03 | 30 | 5.02 | 5.02 |
| 11 | 5.03 | 5.03 | 31 | 5.02 | 5.02 |
| 12 | – | – | 32 | 5.03 | 5.03 |
| 13 | – | – | 33 | – | – |
| 14 | – | – | 34 | – | – |
| 15 | – | – | 35 | – | – |
| 16 | 4.94 | 4.94 | 36 | – | – |
| 17 | – | – | 37 | 4.98 | 4.98 |
| 18 | – | – | 38 | – | – |
| 19 | – | – | 39 | – | – |
| 20 | – | – | 40 | 5.03 | 5.03 |

**Unit: Vrms**

**Table 11-5. IC203 (24LC04B)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | GND | GND |
| 2 | GND | GND |
| 3 | GND | GND |
| 4 | GND | GND |
| 5 | 5.02 | 5.02 |
| 6 | 5.03 | 5.03 |
| 7 | GND | GND |
| 8 | 5.05 | 5.05 |

**Unit: Vrms**

**Table 11-6. IC204 (24LC211/P)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | – | – |
| 2 | – | – |
| 3 | – | – |
| 4 | GND | GND |
| 5 | 3.82 | 3.82 |
| 6 | 3.68 | 3.68 |
| 7 | 4.78 | 4.78 |
| 8 | 4.99 | 4.99 |

**Unit: Vrms**

**Table 11-7. IC301 (TDA9802)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 1.09 | 1.09 |
| 2 | 12.98 | 12.98 |
| 3 | 10.90 | 10.90 |
| 4 | 10.99 | 10.99 |
| 5 | 5.5 | 5.5 |
| 6 | 12.92 | 12.92 |
| 7 | 1.09 | 1.09 |

**Unit: Vrms**

**Table 11-8. IC302 (L2M2M)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 9.57 | 9.57 |
| 2 | 13.02 | 13.02 |
| 3 | 9.54 | 9.54 |
| 4 | 11.03 | 11.03 |
| 5 | 9.54 | 9.54 |
| 6 | 9.57 | 9.57 |
| 7 | 2.12 | 2.12 |
| 8 | 2.13 | 2.13 |

**Unit: Vrms**

**Table 11-9. IC401 (TDA9109)**

| pin # | MODES | | pin # | MODES | |
|---|---|---|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz | | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | – | – | 17 | GND | GND |
| 2 | – | – | 18 | 7.04 | 7.04 |
| 3 | 5.06 | 5.06 | 19 | GND | GND |
| 4 | 3.026 | 3.026 | 20 | 5.30 | 5.30 |
| 5 | 4.02 | 4.02 | 21 | 8.04 | 8.04 |
| 6 | 2.374 | 2.374 | 22 | 3.51 | 3.51 |
| 7 | 2.378 | 2.378 | 23 | 3.44 | 3.44 |
| 8 | 7.97 | 7.97 | 24 | 2.901 | 2.901 |
| 9 | – | – | 25 | 6.73 | 6.73 |
| 10 | 9.32 | 9.32 | 26 | 2.772 | 2.772 |
| 11 | – | – | 27 | GND | GND |
| 12 | -0.5 | -0.5 | 28 | 1.633 | 1.633 |
| 13 | 7.91 | 7.91 | 29 | 12.05 | 12.05 |
| 14 | 2.349 | 2.349 | 30 | 5.04 | 5.04 |
| 15 | 4.65 | 4.65 | 31 | 5.04 | 5.04 |
| 16 | 36.8mV | 36.8mV | 32 | 5.04 | 5.04 |

**Unit: Vrms**

**Table 11-10. IC601 (TL431CLP)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 2.52 | 2.52 |
| 2 | GND | GND |
| 3 | 10.69 | 10.69 |

**Unit: Vrms**

**Table 11-11. IC602 (KA2S0880)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 189.5 | 189.5 |
| 2 | GND | GND |
| 3 | 19.70 | 19.70 |
| 4 | 2.389 | 2.389 |
| 5 | 4.8 | 4.8 |

**Unit: Vrms**

**Table 11-12. IC603 (7805)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 13.04 | 13.04 |
| 2 | GND | GND |
| 3 | 5.09 | 5.09 |

**Unit: Vrms**

**Table 11-13. IC604 (78R12)**

| pin # | MODES | |
|---|---|---|
| | 1024 x 768 / 60 Hz | 640 x 480 / 60 Hz |
| 1 | 12.97 | 12.97 |
| 2 | 12.11 | 12.11 |
| 3 | GND | GND |
| 4 | 9.22 | 9.22 |

**Unit: Vrms**